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Collection and Field Note Book

No. 52

(April 24, 1958 - Oct. 19, 1958)

(39420 --- 39650)

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1958 Marshall Is.

1

April 24 - Kwajalein I.

Rained last night,
heavy wind & clouds, rough
sea at 8 a.m.

Trentepohlia very common
on *Tournefortia* trees on
windward side, some seen
on coconut.

Small water striders (*Halovelia*)
collected under coral boulder
near top of beach.

Scaevola with leaves
much thickened and badly
distorted by salt.

Water striders of 2 sorts, one tiny
black one, one large blue one,
around high tide mark, under
stones and more commonly in
accumulated tufts of *Jarvisia*, etc.

1958 Marshall Is.

Apr. 24 Namu Atoll from
air. (photos 2-10 on Roll 1 b110)
Narrow pass on west
side, with an arrangement
such as this.



Another, more to south,
with two ~~reefs~~ reefs
in entrance



Good native vegetation
on 3 2.2. islets, esp. the
two on the east reef. Wind
grooving very conspicuous
on seaward sides, some coconuts.

Many small bars on
reef. All held by beach-rock
or fragments of reef rock.

Apr. 24. - Kwajalein Islet. Kwajalein Atoll
Trentepohlia
common on bar of Tournepente

39420

2

Apr 24 - Ailinglaplap Atoll ^{from air}
No signs of typhoon damage.
Two passes on west side
with long spits or reefs
running inward from
them on both sides.

On north west islet,
especially there are
patches of forest, surrounded
by coconuts. Much of the
forest a pale yellow-green.
(Photos of Ailinglaplap
from one with curious
remnants of platform on
lagoon side.)

Dull orange color.
and Coconut.

Apr. 24 Jaluit from air
went ~~up~~ along east side
at 300' alt.

Islets vary much in
extent of damage. All
have some coconut trees
standing, some have many.
More trees standing at north end.

Many coconut trees down
on all islets, all of these
or almost all, on s.e. side
fell toward lagoon, all
along seaward side of
these islets a great amount
of fresh light colored coral
debris is deposited.

Much root mat of coconuts
left toward lagoon side.

On southeast side
islets, ~~are~~ narrow,
very little left on them.

Apr. 24 - Jaba Islet -
Some trees standing,
many knocked over
or broken off.


On the large part of the
islet among the buildings
the situation is very
confused, with scouring
and deposition in a
disorderly mess.

Several *Calophyllum*
trees still standing,
at least one *Terminalia*
standing but one very
large one uprooted.
Casuarinas mostly
standing. Some *Pandanus*
standing, many knocked
down, uprooted, or broken
off. All standing trees
except *Pandanus* are
killed back from the tips
to varied distances, many
or most branches broken
off.

Pod of *Fimbristylis cymosa*
apparently unharmed
in places, also *Cyperus* sp.
Phyllanthus amarus
possibly post-typhoon.
Considerable growth of
Crotalaria, fruiting.

On narrow part of island toward Sydney Pier most of the loose material has been removed. Apparently deposited on the outer reef flat ~~of~~ the surface of the consolidated platform is irregular but not too much so. The outer edge of this is very discolored by algae and cut into an erosion ramp. The white part was more or less level but if anything slopes a little toward the lagoon. On the lagoon side is discolored unconsolidated material with pinkish or purplish silt in interstices.

The reef flat is narrow here, perhaps not more than 100 m. wide. On it has been deposited, by the typhoon, a long boulder or shingle ridge, mostly of large slabs of coral, imbricated upward from the ocean side.



up to 2.5 m. above the reef flat said to have been generally of this height and nearer the reef margin after the typhoon.

but to have been getting lower and nearer the ~~ocean~~ shore. There seems little doubt that this was ~~was~~ entirely constructed by the storm of the material removed from the islet, as there is no loose freshly deposited material elsewhere, yet the consolidated platform has undoubtedly been cleared of loose material. This loose material has had most of the smaller sizes removed and most of what remains is of a single kind of coral (sample.). That this is not freshly torn from the reef is shown by the fact that the pieces are somewhat wave worn.

+ Here, on the lagoon side are the remains of a Pemphis forest. Many of the trees are knocked down, always falling away from the lagoon. Many are also standing or partly tipped. All are dead distally, at least. Many are sending out small leafy twigs from the trunks. These leaves

taste more saline than is usual for this species, as well as being astringent. Pandanus, on this narrow section, is in very bad condition, mostly dead, whether tipped over, broken off above the roots, or standing.

Tournefortia is rare here, but very heavily sending out new branches from the trunks. Cordia is somewhat beaten down but is very abundantly flowering and fruiting; is very local.

Ipomoea pes-caprae and Wedelia biflora form mats locally, do not seem to have been inconvenienced by the storm. Scaevola is mostly dead but some sticks are sending ~~out~~ out new leafy branches. Occasional patches of Lepturus seen, but rare.

April 24 - Jaluit I. between Sydney town and Jabor.

Cordia subcordata Lam.
very local around old construction sites.

Birds seen include several common noddies, one whimbrel, one turnstone, a number of wandering tattlers, possibly one golden plover, and, according to Herold Wiens, 6-8 reef herons. I saw one white one from the air, the rest are probably correctly identified. They were on the large oil tanks at Sydney town. A large flock of birds, very probably shearwaters, fished offshore most of the afternoon. They flew very strongly and gracefully.

Bits of iron, spikes, etc. are scattered on the old platform surface, seem to be cemented in - need further investigation, as McKee & Gressitt think they are included in the rock.

Tops of trees killed by typhoon, lower branches very healthy; flowers vermilion.

Apr. 25 from to Mejatto ^{2 midgets flying}

Small island inside pass - many low trees still standing but badly beaten. A few - ~~14~~? coconut trees still standing. A number of Pandanus still standing, some with tufts of leaves.

Next islet - about 12 coconut trees, many Pandanus, and other things but mostly defoliated.

Next islet - small one - 4 coconut trees.

After this we are too far out for observation till we reach Jimja Islet, which ~~there~~ seems much less affected by the storm than others. Many hundreds of coconut trees standing as well as a green understory of bushes, young coconuts, Pandanus etc. but too far away for good observation.

Thin islet between this and Immy has 6 coconuts, one other tree standing, some low bush. Beach material piled up around islet is white.

Immy Islet, south in 1 has many coconut trees standing,

less toward center, it scute, almost none, then more toward north end. Many bare stubs of trees without branches. Some Pandanus with a few tufts of leaves. One noddy, one fairy tern.

Islet at inner end of passage n. of Immy has 14 coconut trees standing, considerable low vegetation, and some Peruvia.

Mejatto Islet - south end has quite a lot of coconuts standing.

North of this they are very sparse. Many more broken off part way up than with tops. Much rubbish on ground. Very few trees in center part show any signs of life. In center some actual gaps in vegetation as much as 50 m wide.

~~There~~ are also flying as eagles. They are not in the same way as before. One grass, a white plant, etc. have.

piece of former size of
main part of island. It is
coconut grove, surrounded
by a bank of water (photo) (photo)

On a rather small, rocky place
at end of island, at P. 1000
and 1100 ft. and a few palms
of Pandanus still in good
shape.

On south end in middle part
of island coconut and
breadfruit trees mostly
knocked down (photo)
but ground vegetation,
mostly lepturus and
thruas, etc., is very
good shape.
Also some Polypodium,
many Pandanus seedlings
of all ages.

(photo)
(photo)
Large mangrove depression
near south end has an enormous
amount of vegetable debris,
brush, dead trees, etc. accumu-
lated in it. The south half
is denuded of large trees,
as the few left are dead. Young
seedlings up to 1 m. are plants
here, but not very healthy.

The north half is in
good shape except that a
few old taller trees are
dead or broken off. Seedlings
of all size are abundant
in the abundant mangroves.
On south edge are a few
half Pandanus trees, with
smaller branches, some
numerous new branches
coming out all over trunk
and main branches. (photo)

The whole depression is
a section of reef flat
enclosed by a high coral
boulder ridge about 3 m.
high. The bottom is hard,
holes out of which
water pours and in to
which it is sucked with
a period of about 11 seconds,
causing a fluctuation of
water level.

The beach ridge has
fairly large Pandanus
trees, a few other trees,
beaten by wind but still
leafy, and grass, etc. (photo)
Also some Pandanus.

Area between swamp
and lagoon is mostly
mud, has apparently
not been swept over by
waves + hurricanes, (photo)
to p. 20

Plants on Mangrove

Coccoloba

Many cuttings in mangrove
Young plants 1-2 m. tall, mostly
alone

Terminalia catappa

Many cuttings in the sprouts

Pandanus tectorius

Many large trees broken off,
uprooted or with most of branches
broken off. Young ones are seedlings
on shallowly undisturbed ground
near north end

Tacca leontopetaloides

a few seen with small green leaves
on exposed ground

Many healthy flowering on
grassy high places and on black
soil covered by thin sand

Morinda citrifolia - on exposed land

seedlings, root sprouts, canes
on north end around mangrove
swamp and on lagoon side with
with clumps of sprouts among
low sedge and shrubs.

Passiflora aralis

Small grove toward south
end - trees of all sizes, mostly
knocked down, but some
standing with branches
removed, all sending out
sprouts, stumps, stubs,
fallen trees, roots, and
some seedlings.

Thunbergia

one small tree near north
about 3-4 dm. diam.
one old tree but most of
growth new, 1 dm. across, loose
for south end and along
lagoon side large healthy
trees at south end of d.
left bank

many well developed seedlings
on south end and along
lagoon side extensive
about 1 m. under the bank
and sand covered black soil.

Thunbergia argentea

very small seedlings locally
on south end seedling
abundant. Some old
plants along lagoon
beach ridge sprouting
from defoliated shrubs

Canavalia maritima fr.
~~seedling~~ seedling about 15 cm. tall
 grassy area large plants at north end

Intsia bijuga
 several sprouts from broken
 down sapling near south end

Polypodium scolopendria
 several plants in old
 coconut grove. Also on
 trunk of fallen breadfruit tree.
 Abundant in wooded area
 ground on south end and
 along lagoon side

Wedelia biflora
 seedlings up to 20 cm. long
 common. Some sprouts
 from old stems partially
 buried.
 on south end and along
 lagoon large mature flowering.

Freemantliana
 clump of sprouts from old wood
 stump.
 near along lagoon beach edge
 near south end. sprouting.

Leucaena leucocarpa
 dense clump of sprouts 3-4
 cm high from old *Protium*
 stump

Justicia speciosa
 a few sprouts from old
 stubs & down saplings,
 in old trunk 7 dm thick
 is still abundant - sprouts
 common on south end and
 along lagoon side of beach ridge.
Leucaena - sprouts
 many seedlings, cotyledons
 only, occasional on bare
 rubble, scattered on beach
 ridge. Large
 seedlings in coconut root
 mat.

Large plant on lagoon
 beach edge of south end.

Coffea arabica
 One tree, plant in a good
 place near base of coconut
 stump. Large clump on side
 of fallen large breadfruit tree.
 Common on ground and on
 fallen sapling near margin of swamp
 on south end, also in disturbed
Artocarpus like ground.
 Dead standing trees and
 dead fallen trees.

One fallen sapling with
 a single green sprout
 not far from lagoon.
 Fruit - no seedling (??)
 Large tree sprouting from base
 of dead.

Flacourtiaceae - ruderalis
 fairly common in undisturbed
 grassy areas on north and south ends

Chrysopsis angustifolia
 also in grassy areas on north and south ends

Eleocharis indica
 also in grassy areas on north and south ends

Sigona maritima
 flowering
 in swashed and more rarely
 on sand-covered soil near
 south end

Rumex acetosella
 in mangrove swamp
 and in depression near north
 end, also some along lagoon
 shore. Sprouting abundantly
 along trunk and main branches.

Isosoma grandis - one small
 shrub knocked down but
 growing vigorously near
 mangrove swamp.

Trinervia procumbens
 seedlings abundant on
 unconsolidated soil and on sand.

some old plants in under-
 scrub on sand-covered areas.

Nepenthes aculeifolia
 Common epiphytic in
 mangrove area, but mostly
 almost dead or just
 beginning to sprout.

Barringtonia conjugata
 Abundant in large
 mangrove swamp, in
 part healthy, in part
 large plants dead or
 sprouting from base in
 smaller swamps only
 seedlings on a line also
 on not-stand swampy
 by gravel.

Calophyllum inophyllum
 Large tree along lagoon
 side and some in land
 near, stood up very
 well, others tipped over.
 Mostly defoliated but
 sprouting.

Quadrantaria canthioides
 - var. *atropurpurea*
 Large plants in center of
 island bent over but
 abundantly flowering
 see p. 23

Several pairs, terns
 are white and one grey
 reef heron

mini ~~zone~~
~~zone~~ zone

1 Area near water where
 where much material
 has been moved, partly
 held by coconut root mats

2 Sheet of deposited material
 sized - white material
 in middle of islet, reaching
 lagoon in places.

3 Black soil covered by thin sand

4 Black soil, grassy, undisturbed
 but not washed off

5 Area not undisturbed, protected
 by mangrove swamp

6 Area seemed clean on
 lagoon side

7 unfilled mangrove
 depression

8 Deltas in edges of lagoon

9 Rubble tracts on seaward
 reef flat.

Old house to 12

Parsonsia rubra

in a small tree at old
 house site in area near
 the grove swamp not
 inundated - topped over,
 topless, but flowering

Very small area

A few small plants seen
 on grassy spot not covered
 by sand or seaweed.

Parsonsia rubra

has a lot of material on
 area, can't see plant in
 area, but it is not at all
 covered by sand or
 grass. Seeded area very
 low area with mangrove
 swamp and on lagoon side
 ridge on south end.

→ Rubble tracts are opposite
 across channels running
 from lagoon to reef sea.

Sheet of deposited material
 covered lagoon side
 and dropped, covering
 soil surface.

Several blue-tailed skink seen
 on lagoon side of south end

April 29 - Meja Itto Islet

- 39422 *Nephrolepis ac. bifolia*
common on tree trunks in
mangrove depression
- 2 33 *Pseuderanthemum can. liliifolium* Seem.
persisting around former
house site
- 2 24 *Pseuderanthemum can. liliifolium*
var. *atropurpureum* (Pohl) Forst
(moss)
- 2 25 moss
on base of coconut trunk
- 2 26 (moss)
same
- 2 27 (moss)
same
- 2 28 (moss)
on tree trunk in mangrove swamp
- 2 29 (moss)
same
- 2 30 (moss *hepatic*)
same
- 2 31 (moss *hepatic*)
same
- 2 32 (alga)
same

rhizome and roots form
large masses, fronds
drooping
abundantly flowering
after being beaten by typhoon
leaves green
same leaves purplish
flowers crimson, dotted
brown by submarginal
in salt water during typhoon

April 26 - Boat trip to Elizabeth I.
from Jaluit

Jaluit I. The density of standing palms very low southward to beyond 6 fringing and then for a considerable distance there are none. Then about half-way there are a few for a considerable distance the density gradually increases till in the last 1/5 there is no appearance of any damage. Also there is some damage but not much water came over here. to 100-200 ft at over 1/2. This section is the part where the reef has more or less continued the sudden increase in greenness is just where the inlet bays.

All islets on south reef from Jaluit to Elizabeth and westward have same appearance of little damage, viewed from the lagoon. Elizabeth has thinnest appearance except for the second row west of Jaluit I.

April 26 Elizabeth I.

No water damage on this islet but some damage severe.

Many trees blown over or snapped off, mostly toward east or somewhat south of east somewhat north of east.

Ground vegetation scarcely affected except for yellowing or browning of leaves.

Breadfruit shows every degree of damage from being completely thrown and killed to some that are not much affected and bear 1/4-1/2 grown fruit.

Most standing breadfruit trees have most of smaller branches removed and small leafy shoots appearing in all parts. These broken off a few feet above ground have the most conspicuous development of leafy sprouts.

Blue Tailed and Black
sheep seen.
Small flock of Brown Terns.
A few common noddies on lake.

Plants seen on the hill
 Pandanus tectorius
 Artocarpus altilis
 Calophyllum inophyllum
 Lipturus repens
 Chrysanthemum angustatum
 Fimbristylis cymosa
 Centella asiatica
 Liriodendron papaya
 Polypodium scolopendrium
 Crinum sp.
 Laccosiphon petaloides
 Morinda citrifolia
 Fragaria amabilis
 Miconia obtusifolia
 Musa sapientum
 Vigna unguiculata
 Eleusine indica
 Hymenocallis littoralis
 Gomphrena globosa
 Mercurialis jalapa
 Tagetes sp.
 Portulaca oleracea
 Hernandia sonora
 Alocasia macrorrhiza
 Triumfetta procumbens
 Clerodendron bipartitum
 Phurba involuta
 Pteris caudata
 Pinguicula conjugata
 Cassipouera filiformis
 Clerodendron amaranthifolium
 Digitalis purpurea - small patches
 Plumbago indica

Alnus amaraefolia
 Nerium sp.
 Polygala scutellaria
 Siphocampylus parviflorus
 Anthoroma sagittata
 Polygala sp.
 Vaccinium sp.
 Carum sp.
 Liriodendron glaucum
 Nephrolepis aculeifolia
 Nephrolepis incantata
 Cochlospermum variegatum
 Cyrtandra stylis
 Asplenium nidus
 Hedyotis corymbosa
 Capriphorus sp.
 Guettarda speciosa
 Allophylla diversifolia
 Ruppia chrysomela
 Wedelia biflora
 Scaevola taccada
 Tournefortia argentea
 Cordia alliodora
 Terminalia catappa
 Boerhaavia tetrandra
 Ipomoea digitata
 Canavalia maritima
 Thuarea involuta
 Leucaena leucocarpa
 Passiflora grandis
 Nephrolepis argentea
 Pteris caudata
 Vitis rotundifolia
 Peperomia

All tree species suffered considerably from wind. Some of even species observed, most *Calophyllum* however. All but a number, however, were uprooted.

Small mangrove depression on south side near outer beach - *Sonneratia*, *Bruguiera*, *Avicennia*, *Allophylus*, *Ipomoea*.

Much debris - 1 dead tree.

Large pond, west end filled with *Sonneratia* forming a *Sonneratia* patch. Mangrove roots patches of *Bruguiera* (photos).

South end of island much more *Sonneratia* than other parts, but much damaged by storm. Many *Sonneratia* trees not much hurt but *Sonneratia* mostly knocked down. Coconuts less damaged than elsewhere (photos).

Sonneratia suffered more than any other species - most of the trees on the island being broken off, usually 2-3 m above the ground. Most have at least some branches with green leaves.

Along the outer end of the island on the narrow side, edge of mangrove, well vegetated, but a small area upland in a pond.

Calophyllum along lagoon beach scarcely affected by storm. On north-west side the beach is bordered, a few trees are present.

Along a number of ponds, including coconut, *Sonneratia*, *Calophyllum* of *Sonneratia* but with roots on one side still in ground, continue to grow.

A few trees still have good coconuts on them, including one that was blown down.

mejuniak
April 20 (Elizabeth)

- 94433 *Portulaca oleracea* L.
along paths in inhabited areas
- 34 *Centella asiatica* (L.) Urb.
in uninhabited areas common
- 35 *Sphenocarpus hirsutus*
in open north end - coral rubble
- 36 *Terminalia samoensis* Rech.
rare on east end
- 37 *Intsia bijuga* (Colebr.) Ktze.
local on east end
- 38 *Euphorbia charissimus* Boiss.
common on lagoon beach ridge
- 39 *Canavalia microcarpa* (DC.) Piper
common on east end of islet

Euph. char - "berai" or "perai"
Constipation - ~~drink~~ as infusion
in either hot or cold water

Centella - "manuk"
constipation - use infusion.

Terminalia "akunij"
used to cure yaws and diarrhoea
drink infusion made with
hot water.

fleshy prostrate, forming
a loose mat 11-5 dm across.
flowers yellow
forming large dense
mats, stems superficial,
bracts erect.

shrub 1 m. tall, stems

sprouts from old stems
sterile

stems spreading, somewhat
ascending, glands
angular, thick, yellow.

leaves, flowers rose pink.
"warlap" used for medicine,
for headache and pains.
When a person is too thin
and wants to get fat - squeeze
the plant in water, pour
it then bath with water.

Portulaca - "mamiliya"
drink infusion for
many troubles

Intsia "kubuli"
Pongape when young people
want to marry and
after a while difficult
worms they drink water
in which this has been squeezed.

- 39440 *Nephrrolepis bisectata*
common on ^{coral} rubble and rubble
- 41 *Nephrrolepis acutifolia*
common on coconut logs
and stumps (also epiphytic)
- 42 *Procris pedunculata* (Forst. f.) Wedd.
common on bases of
coconut trees and on coral rubble.
- 43 *Peperomia*
common on coral rubble
usually shaded.
- 44 *Vittaria*
rare, epiphytic
(fungus) on rotting wood
- 45 *Schizopodium* common
common on dead wood
- 46 (lichen)
on coconut log
- 47 (lichen)
on coconut log
- 48 (lichen)
on coconut log
- 49 *Enteromorpha*
very abundant in large
mangrove depression
- 50 (blue green)
common in mangrove
depression, on sheets of *Enteromorpha*
- 51 (blue green)
common on knees of
Bruguiera in large
mangrove depression

fronds erect

fronds erect, large
masses.stems as much as 0.8 m.
long, curled at tips;
sterile.
fleshy.

fronds pendent

forming sheets, floating
at high tide.

- 39453 (fringe)
 probe up to ground
 54 *Coccoloba nana*
 on outer beach ridge

Apr. 27 - Jaber, Palmit 1
 in ~~the~~ experiment station
 grounds devastated by typhoon

- 55 *Ipomoea littoralis* Bl.
 very local, near beach
 56 *Isopogon virginianus*
 abundant around saline pond
 57 *Ipomoea pes-caprae* Sw.
 on coral gravel
 58 *Dentella repens* Forst.
 common on coral gravel
 59 *Digitaria pruriens* var. *macrocarpa*
 local on coral gravel

Apr. 27 - Sydney, Town,
 Palmit 1

- 60 *Ipomoea tubosa* (Schlecht.) Don
 common on embankment
 around old tanks.

tree 14 m. tall thrown down by
 typhoon (The mutant form
 also known from one tree on
 Mazura, where the seeds are
 known to be sterile)

prostrate, flowers purple,
 no flower center,
 sterile

fleshy

prostrate, flowers in high
 appeared after bananae were
 brought from Russia and *Ipomoea*
 decumbens & ascending

extensive vine, flowers
 white, opening in evening.

Apr 22 Jalut, Jalut?

Plants surviving on
old botanical garden and
experiment station.

- c-a Stachytarpheta jamaicensis
- a Glehnia littoralis
- a Euphorbia thymifolia
- l Dentella repens
- l Cyperus compressus
- lcp Leindorffia aurea
- ob Ficus elastica
- a Leucaena glauca
- c Vernonia cinerea
- a Peddyotis biflora
- ap Erythrina var. egesta
- la Lepturus repens
- a Grotalaria micrantha
- c-a Pilea microphylla
- a Physalis angulata
- a Phyllanthus amarus
- c Portulaca oleracea
- c-a Amaranthus viridis
- c Euphorbia hirta
- a Eleusine indica
- l Mounda citrifolia
- lc Cyperus Kyllingia
- c-a Cyperus javanicus
- c Vigna marina
- ap Gerbe pentandrus
- cp Pseudanthemum caeruleum
- ob and m. atropurpureum
- lcp Acalypha mentacis
- cp Anticarpus altalis

- ca Solanum sp. sp.
- ~~Phyllanthus~~
- lc Euphorbia pinnatifida
- l Cerbera manghas
- lc Alocasia macrandra
- ap Ipomoea pes-caprae
- c Eragrostis amabilis
- c Echinops poliolus
- lc Lycopodium nodiflorum
- c Brassia actinophylla
- lcp Sansevieria rotundifolia
- ap Phoebe
- cp Terminalia catappa
- cp Ficus elastica
- cp Casuarina equisetifolia
- a Hippoboscus longiflorus
- ob Cyas cirinalis
- lc Luperumia pellucida
- ob Ficus tinctoria
- lcp Colocasia esculenta
- lc Xanthosoma sagittata
- l Couratella argentea
- lc Euphorbia frutescens
- l Musa
- l Premna obtusifolia
- lc Pomoea pes-caprae
- lc Flourensia coccinea
- a Canva papaya
- lc Gomphrena globosa
- c Cinnamomum
- l Hydnora littoralis
- ap Cordyline terminalis
- c-a Fimbristylis cymosa

- 1a *Thruarea involucrata*
 1c *Prunella pauciflora*
 c *Lindanus tomentosus*
 1a *Wedelia biflora*
 1 *Comphos aridula*
 1a *Casipala repens*
Brugmansia conjugata (dead)
Chorizanthe subulata (dead)
 1 *Calceolaria*
 1 *Asplenium nidus*
 1 *Epiphyllum latifolium*
 1 *Clerodendron inaequalis*
 1a *Hibiscus occidentalis*
Citrus aurantiifolia
Citrus maxima (dead)
Citrus sinensis
Citrus (argentea) (dead)
 1 *Cassia occidentalis*
Cucurbita pepo (dead)
Cucurbita maxima (dead)
Cucurbita sativus (dead)
Citrullus vulgaris (dead)
 1 *Zephyranthes rosea*
 1a *Rigida viridiflora*
 1 *Cyperus rotundifolius*
 1 *Eleusine indica*
 1 *Ipomoea pes-caprae*

Flocks of terns around
 small pond
 forest foraging terns
 1000 ft.

Most of the trees in the
 open area are dead
 but many are still
 with new shoots coming
 out of trunks. *Lindanus*
 many of them broken off
 and killed, but also
 growing with living branches
 on them. Some of the
 trees, such as *Tournefortia*,
Caribaea, *Passiflora*,
 are dying down and sprouting

Hibiscus plants are
 growing luxuriantly,
 forming a complete ground
 cover. *Crotalaria* is the most
 abundant but *Amaranthus*,
Chenopodium, *Cyperus*, *gavarrus*,
Eleusine, *Pereskia*, *Eleusine*
 are all abundant
Leucaena glauca very
 abundant on some areas.

Crotalaria are spread over
 small patch on the hillside
 by the larger, present plants,
 flowering and fruiting, and
 are adjacent to *Ipomoea*.

Apr 27, 1964, 11
 of job was beyond Sydney Cove

(photo) The upper side of the
 reef flat has been
 placed in some form of
 more or less than
 was on Apr. 21

Some fine coral has
 been moved around

(photo) On the flat side of the
 and it is scattered
 boulders, but all are
 old blackened ones.

(photo) The arrangement of
 Acropora slabs is all
 with dip seaward, even
 down the ridge.

The main problem is
 to account for the
 amount of rounding
 to be seen. The slabs are
 Acropora - mostly
 broken with edges of
 which are rounded off.
 The Pocillopora is small,
 brown but with the black
 broken off - some lagoon
 type of Pocillopora with the
 south material. Occasional
 slabs blackened on one
 side, but generally part of
 material that is black
 high tide is white.

Along both seaward
 and lagoon side the
 conglomerate platform
 being peddled off of
 a rather smooth, ~~black~~
 old eroded surface.
 sloping gently toward
 sea and from gently toward
 lagoon. The former is ^{more} prominent
 below platform lagoon
 and the latter has gradually
 been eroded away
 as it is not yet case hardened.

On lagoon side is a
 wide flat, mostly a
 consolidated surface, in
 places covered by thin sand.
 that is less or more in
 the lagoon side surface
 and extends off into the
 lagoon. There is all much
 decorated by algae and
 many small covered by high
 tide. The vegetation is
 very light algae. On
 slightly higher ground
 in lagoon.

On lower surface
 extends in long lobes
 or channels into the
 inlet. Now cliffs at head
 of these channels.

There are occasional
small groups along
main road only. ~~the~~ I heard
tattle.

One out of 10 and one of five
each. Some - white and
one white around old lady -
perhaps including some of the

On embankment around
old Santa Fe river, Fort
Sawyer, Pinal Co.,
Ariz. *Arctostaphylos*, *Yucca*
arborescens, *Chrysothamnus*,
Prosopis juliflora, *Opuntia*

One white berry - 31
a few black flowers.

Dr. odd. Cms. 1011
Herald - 1011

South of ^{typical} ~~these~~ about 100
m. a channel cut
almost through the colt
to a depth of about 2 m. or 2.5 m.
curved, obviously artificial.
This goes into a compact
layer which corresponds
to the abraded surface
mentioned above. On the
are two separate layers
of very coarse porous
but very consolidated
material, each about 1 m. or
a little less thick, unconformable.

1 April 38 Ringed-bill

Large opening upon a hill
on the village decorated
with a view.

about the middle of the
standing - made some
to me - I was so well
of the old and the new
rather more - we went
and many to visit the

Mass. sample off 15' from
top. Even small thin corals
shown.

[illegible]

The grasses of the bays
are much more abundant
here than in the other places
along the coast.

Fuller - Broad Street - 1000
 Cincinnati - 1000
 Annapolis - 1000
 interior.

Spore: 10-15 μ diam.
1-2 hours in air. Large
and small spores - finally all
are the off - all above ground.
A large lighted room

Plants seen
 Transfetta
 Cocos
 Clematis
 Lepturus
 Catharanthus
 Pandanus
 Calophyllum
 Canoe
 Antecarpus
 Euphorbia hirta
 Eragrostis amabilis
 Asclepias
 Cyrtocallis
 Fimbristylis
 Paspalum conjugatum
 Alocasia
 Morinda
 Tacca
 Vigna
 Asplenium
 Polypodium
 Rhytidium
 Citrus aurantifolia
 Hibiscus tiliaceus
 Nephrolepis hirsutula
 Pipturus
 Citrus
 Cucurbita maxima
 Wedelia
 Platanus
 Ficus
 Thuarea
 Allophyllus

Digitalis
 Cyperus gracilis
 Solanum nigrum
 Cissampelos
 Ischaemum montanum
 Ischaemum macrochaeta
 Crotalaria retusa
 Cassia
 Terminalia
 Solanum
 Thysanotus
 Centella
 Euphorbia hirta
 Juncus
 Euphorbia prostrata
 Psidium
 Adiantum
 Spathoglottis
 Plumbago
 Gomphocarpus
 Guettarda
 Cordia
 Vitex
 Rhinocarpus
 Cyperus
 Eleocharis
 Coelocarpus
 Oenothera

A pile of stones and
wooden and iron. But
the last stone is broken.

On golden yellow
grass, a small tree
along lagoon bank, stems
near 10' of

breadfruit given to go
about trees, standing
but now it is broken
the tree off. There is no
tree here.

Most of coconut trees
down in part of
from trees east to southeast
Here are numerous
mounds of coconuts
of Liptonia in bank
ground. Dark things and
Lagotis, but not
with red. Perhaps are
in part a good stand
of Liptonia pergrua fruit
plants small. They are
not over 3' tall. The
yellow is a small
tree. From 10' to 15' tall
complicated in structure
and shape.

Another part north of
the lagoon, has less
Liptonia pergrua and dead
Pandanus. A few small
Crotalaria and Rubus chloa

little. The trees are
small and in the

small mangrove
swamp, all the Liptonia
about 10' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall.

There are many
small trees and bushes
about 10' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall.

The plants are small
bushes, a single of
Liptonia pergrua
about 4' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall. The
plants are small
bushes, a single of
Liptonia pergrua
about 4' tall.

April 27. Ponghlay Island
in open area of ground back
of village

3946 *Hemigraphis repens* (Forst.) T. And
rare

62 *Paspalum conjugatum* Berg.
abundant

~~*Impatiens*~~

63 *Euphorbia thymifolia* prostrata Ait.
abundant on open
ground around dwellings

64 *Calanochloa*
abundant in large taro pits

65 *Cyperus odoratus* L.
common

66 *Eleocharis acicularis* (L.) Rostk
common in mud

~~*Eleocharis*~~

bottom of lagoon

67 *Thalassia hemiphragmus* (Ehrh.)
Aschers

prostrate, ~~flowers~~ purple
in light ~~the~~ falling very easily
prostrate ~~the~~ ~~leaves~~
leaves T. of 1 ft.
long
prostrate, purple

growing in open
area, ~~leaves~~ ~~leaves~~ ~~leaves~~
drooping slightly
densely, ~~leaves~~ ~~leaves~~

trapped

Area of land of 1000 sq ft
recently cleared
great mass of grass &
by the grasses in the
masses of small
leaves. Ground covered by
soft red sand. with white
specks.

April 28 - Labor
~~Palau~~
Palau

39468 in Inhabited area, flooded by salt water during typhoons & northwinds
algae in old cistern. New Palau notes seen

- 1 69 *Casuarina equisetifolia*
planted
- 2 70 *Euphorbia thymifolia* L.
abundant path
- 14 71 ~~*Nauclea*~~ ^{*Naucleria*} *parmentaria* (Forst.) C.E. Sch.
local in old experiment station
- 3 72 *Blechnum papuense* Kunze
abundant locally
- 13 73 *Amaranthus viridis* L.
weed
- 3 74 *Cyperus compressus* L.
weed along paths
- 14 75 *Solanum nigrum* L.
common weed in
- 3 76 *Stachytarpheta jamaicensis* (L.) Vahl
common weed

tree 10 m tall, thickly
battered by storm
prostrates, leaves green

branched herb 0.3 m tall
spreading tuft

branched herb 1 m tall,
flowers white.
erect herb 0.7 m tall,
banded; flowers blue violet.

- 7947 *Lynedrella nodiflora* (L.) Gaertn.
common weed
- 78 *Crotalaria incana* B.
very abundant
- 79 *Lycopersicon ~~esculentum~~ rotundifolium* L.
common in paths in village
seen in the garden of the
old hospital and station

root up to 0.8 m tall,
flowers yellow, no
brown lines.
bulbs deep, buried, leaves
spreading

enclosed in a case of happy
depression about 2 m. wide
filled with loose rubble
of vegetated ridge.

Leaves of seedlings numerous
especially on north side
of Asplenium.

Many small seedlings
of *Asplenium* are seen
around my foot on edge
of tree, but many more
as many more on the
depression in the tree as
attached, with few
grown on a few and in places
the dominant vegetation.

On side of inlet to
pass the water is consolidated
bed of sand about 100
feet level. A small amount of
a small rough sandy of
newly worked material.
The ridge that extends to
the is slightly above
the general level of the
ground, which is eroded and
is white. The part of
the general surface that
is enclosed and forms
the bottom of the depression
is gray and shows little
evidence of abrasion.

It has a sparse growth
of small *Pomplia*, 1-1.5 m.
tall, not damaged by
storm, though several
trees along inner side
of depression are tipped
over and much debris
is piled up on the
inner ridge.

Pandanus and *Ashroa* fruits
abundant but *Ashroa*
is not germinating and *Pandanus*
very rarely.

Leucaena and *Leucaena* seedlings
common also *Guilfordia*, and
is called *Leucaena* *Leucaena*.

Leucaena a few patches
in open places.
Leucaena local in one opening.

Leucaena abundant
especially on each ridge.
Guilfordia and *Leucaena*
Leucaena somewhat less so
in some vegetation but
sparse.

Polypodium common
in some places.
Polypodium mostly ~~is~~ almost
dead but some sprouting.

Photos from about 1/2 mi
roll 4 (10) are of mangrove from
lagoon?

Account of Lagoon Mangroves
located on Toward Lagoon
about 1/2 mi. N. of
lagoon toward lagoon
all from 1/2 mi. N. of lagoon

1/2 mi. N. of lagoon
1/2 mi. N. of lagoon
1/2 mi. N. of lagoon

1/2 mi. N. of lagoon
1/2 mi. N. of lagoon
1/2 mi. N. of lagoon

1/2 mi. N. of lagoon
1/2 mi. N. of lagoon
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1/2 mi. N. of lagoon
1/2 mi. N. of lagoon
1/2 mi. N. of lagoon

1/2 mi. N. of lagoon
1/2 mi. N. of lagoon
1/2 mi. N. of lagoon

[illegible]

... ..

beach ridge

Highest part of platform
inside crescent bar and
apparently phosphatic.
(sample 5) The black
soil is probably lagoon
mud, but *Scaevola* left-
Moinda and *Allophylus*
common. *Pipturus* seedlings
abundant. *Croton* and
Pandanus largely knocked
down.

Just inside beach ridge
and outside mangroves
is a pond with only
a few mangroves, obviously
partly filled in by
fresh rubble removed from
beach ridge. Near it
is a grove of *Pandanus*
and *Kingia* trees in it.
All taller trees pointing
directly inland, more or
less due south.

East half of this pond
almost filled in with
beach ridge debris and
tree & trash.

In road on coast
toward mangrove
lying pointing 20° N of
south. Mangrove
up to beach ridge.

little lagoon

In indentation on side
toward mangrove in the
open area back of house
great density with *Nepenthes*
lepturus, etc. growing
coconuts a year or old.

Water sample from well
99' from beach ridge 10' from
low water mark.
Depth 6' deep. Water fresh,
all parts over 10' deep.
Well lined with wild man.

Small flock of wild ducks
1000 birds, 2 from 1000
1000 birds, 2 from 1000
1000 birds, 2 from 1000
1000 birds, 2 from 1000

2 black & white
blue & white & pink warblers.

Apr. 10 - Sunday

Gent
 Iridodactylus
 Musa
 Cephalyanthus roseus
 Cissampelos
 Antocarpus alatus
 Eleusine
 Hippocrepis
 Marabilla
 Cucurbita sp.
 Wedelia
 Lipturus
 Polypodium
 Crassulita amabilis
 Centella
 Thunbergia
 Cuscuta polystachya
 Gynostegia alata
 Cissampelos
 Thunbergia
 Nephrolepis cordifolia
 Nephrolepis hirsutula
 Cordia
 Gomphocarpus
 Pandanus
 Cassipourea
 Tacca
 Sagittaria
 Scheuchzeria
 Ochrosia
 Pyretaria
 Flammula

Elaeagnus argentea
 Asplenium
 Lipturus (seedling)
 Bauhinia
 Pristionotus unguis
 Vigna
 Alocasia
 Canna
 Portulaca oleracea
 Brunfelsia
 Cucurbita maxima
 Hedysotum biflorum
 Euphorbia corollata
 var. atropurpurea
 Senecio
 Calophyllum

body part of directions
but more so. The other
any other way. The first
opposite the ...
tipped over and said.

Large rubble tracts
on seaward reef.

Inland on west third of
island the ground is covered
of the ground and by the
some *Wadellia* and other
by insects. Water may
have come over here but
left few traces, little
trash.

In center third much
water obviously came
over. In narrow belts of
trash. Much gravel,
etc. Most of coconuts
and other trees are down
here, mostly pointing
from 20° of north to 36°
of south.

Soil has been largely
either covered up or blown
away. The ...

East end has been
even more affected.
Rubble being deposited

almost to the lagoon
shore. Most of trees down

end has not had
much water across
it but some

Many trees are down
mostly pointing south
or a little west of south
but at a few point north
More standing trees
here than elsewhere on
island.

In slight ~~interior~~
lagoon
side there is a tiny
gravel ridge at top of
beach, then is cobble to
boulder beach, rather
wide, then just
exposed at low tide,
a wide sand flat,
fine sand, exposed
gravel.

It is about 15-20 cm deep
gravelly thinning
westward till a low tide
level pitted rock platform
is exposed. Then along
shore for about 20-30 m.
a platform is exposed.
Below a gravel ridge
1.5 m. high.

Apr. 30 - Legro's Island.
 Brown booby flying over
 lagoon, very dark phase.
 Hundreds of frigate
 birds. Thousands of
 noddies, noddy-eaters,
 white-capped, a very
 few fairy terns, many
 boobies mostly brown
 or cinnamon stage.

Indica, Indica
 Coconut large, Passerina
 to 100 ft. more down, down,
 pointing approximately
 south.

Many germinated
 coconuts at top of beach.

In turn of salt water
 a Pisonia grove with a few
 large Indica. From the Indica
 and many of the Pisonia
 are down, Pisonia is sprouting
 vigorously. Indica a few
 sq. Pisonia that are
 standing have most
 of branches broken off
 but are sprouting very
 vigorously.

Some more of the Indica
 especially on northeast
 side of lagoon, and
 some more Pisonia
 especially common in lagoon.
 Many coconuts and long
 grass and patches of Scaevola
 in grass extension of
 point, a fine stand of
 Pisonia beach, beach
 by lagoon but with
 still some Indica the
 substratum is a pitted
 very dark gray anticlinal
 platform.

4 crated terns
 Wren, some small flock of
 crated terns.

Non-paired Indica
 Pisonia flowering and
 fruiting vigorously.

Dark sand washed
 inland with humus-
 probably animal condition
 before lagoon, very little
 white sulfate soil found only
 a little immediately
 around base of large tree.
 No hole with water
 but no crustaceans or insects.
 1-2 inches of sand over
 humus on north side.

Phalaropus lobatus
Phalaropus lobatus
Gallinula chloropus
Lesser Frigatebird
Cordia
Thymoclea sumatrana
Thymoclea
Asplenium
Patyris
Loxos
Symphoricarpos
Lepturus repens
Canavalia
Uspina

10 birds capped nesting
 nests in abundance.
 about 10 nests with eggs or
 downy young visible from
 observation in a fallen
 tree trunk, nests obviously
 built after tree had fallen.
 Mangroves, *Sonneratia*
 and *Avicennia*.

Long curved sand bar
 on east point of island.
 Covered like mounds toward
 outer reef. About one or
 two feet high. Also one at
 same place.
 East of island a

long reef about 100 m. or
 more, which means
 a tall reef, enclosed
 lagoon open at both
 ends.

Large shallow
 lagoon beyond end of
 reef and stretching
 for 10 miles.

11 birds capped nesting nests
 very compact, made up
 of *Isospora* leaves, possibly
 stuck together with cement
 from appearance but the
 not investigated. Apparently
 about 10 birds sitting by
 nests, allowed themselves
 to be handled, possibly
 young not yet flying.

April 30 - Magat to V

Well about 1000 ft. from sea
 & deep through rubble
 the entire area
 Coarse roots from Crowned
 black root layers all
 the way to bottom becoming
 a fine sandstone and
 None in overlapping layers
 Two overlapping layers
 to one 7". No forams.
 Next layer, with fine
 forams 2-3

Look large black and
 filled with roots.

Under this rubble with
 decomposed forams 4-8
 in situ the depositor sheet.

Then well in bottom
 of depression, uniformly
 dark gray 3-6. water well
 smooth. No V.S. etc.

I cut out a small
 sharp rubble ridge
 along seaward shore.
 small depression back of
 it. In deep there
 is a top of fresh
 rubble sheet.

How spread around
 little elevation here
 caught sea shell. Some
 evidence of strong flow inward.

1-7 large clams

Therapsites, still very abundant

Hydroids

Large ss

Leptaster

Hyphessopus

Isosoma

2000

Leptaster

Hydroids

Hydroids

Hydroids

Trinacra

Leptaster

Hyphessopus

Isosoma

Hydroids

Hydroids

Hydroids

Hydroids

with flat, thrown out
 upward and into pedicels
 100 ft. or more. But evidence
 of flow of sea water continues
 inward.

Hydroids with brachio-
 podes.

Large coral standing
 Casuarina some and poor middle.
 Just below these are two more
 layers of debris.

Therapsites and Hyphessopus
 mostly dead ~~and~~ some
 modern.

Inner side may have
 been covered by salt water
 but little evidence.

Erosion from lagoon shore
 has cut away soil in
 places.

rec. mostly pointing toward
 across but in places confused.

Apr 23 (Temp 84)

39474

in open

on bank of dead lagoon front

Apr 24 - Temp 84

80 *Portia biguttata* (coleb.) Ktze.edge of forest in white sand
black ridge

81 (Temp)

open sand in white sand
lagoon & beach ridge

Ribbon

Apr 27 (Temp 84)

84 *Leucophaea*

at base of coconut tree

Lagoon

April 30 - (Temp 84)

82 *Pisonia grandis* Bl.domes not true in vegetation
of islet83 *Pisonia grandis* Bl.

same

May 1 - Lagoon

84 *Veronica cinerea* (L.) Less. var. *parviflora* (Hb.) DC.very common weed in lagoon,
flooded area85 *Ageratum conyzoides* L.

very common weed above beach

small tree

large shrub in lagoon
in front of lagoon
in the lagoon & salt waterLow tree with massive
purple flowers pale green

same

flowers purple

flowers white

May 1 - 1/2 L. L. L. L. L.

cut across to cut
cut into a compact layer
extending across the cut
but becoming more sub-
sided. Well consolidated
but not can be cut.

then a rubble, layer
weakly consolidated
can be pulled apart with
pick. Top of flat.
Judging by algal growth
this top corresponds with
highest, layer is about
2.5' thick & somewhat more.
Has numerous faults filled with fine sand.

Over the is a rubble
layer of rubble in 4' and
to 3.9' at highest point
near seaward side. The
has little or no fine material.
It is weakly consolidated
at least near cut. Here
it shows some fine sand
deposition. May be some
away from cut.

Because of doubt that
this middle layer may
be like the sheet deposit
or Megalite and could be
consolidated because
between tides.

width of sheet from
margin, edge of sheet to
cut.

For section north, reference to margin
of middle layer.

1	2.1	2.5
2	2.8	2.6
3	2.1	2.6
4	2.1	2.8
5	2.1	2.7
6	2.1	2.8
7	2.1	2.7
8	2.1	2.7
9	2.1	2.7
10	2.1	2.7

Top layer is weakly
consolidated

cut across - 1/2 L. L. L. L. L.

Very high tide in afternoon -
many deep channels filled
with water so that some
of the high tide flow
into the garden
cut and some of the garden
into the water flooded.
Spilling water 4 years
of it now. Spilling on
the garden plot flooded
by 6 inches of salt water.

May 2 - Lighter from
 Lagoon & Elizabeth
 small boat. ^{small boat} ^{small boat} ^{small boat}
 From light to see
 that all boats are
 prepared to go.
 Direct way, passing
 in canal to pier, then
 to lagoon. All small
 boats. I saw a lot
 but not a single one
 at pier of Lagoon. I
 a white mud flat sheet
 cover the east side
 of about diameter
 of square part to
 north. Change in
 amount of vegetation
 damage almost. Large
 mangrove swamps
 not much affected.

The growth in lagoon
 around head of Elizabeth
 more around head
 on north side. There
 are some small affected
 by storm.

A small small
 islet, toward Lagoon
 greater than any
 between Elizabeth and
 Lagoon.

I saw a lot of second
 growth along west side
 of lagoon. Some small
 but not much without
 second growth. In color
 as if muddy brown and.

Along west side of lagoon
 within 100 ft. seems to
 be surge channel
 both on lagoon and
 seaward side.

In islets north of May 2
 a lot of mud flat cover
 around 100 ft. of islets
 low islets in lagoon
 side.

The pattern is perhaps 5 ft.
 from north end on west
 side then much less
 all way.

[illegible]

May 3 - Makabali

May 3 - Makabali

- 39436 *Dentella superba* Forst.
abundant around edge
of an atup

May 4 - Kwajaleen Island

Kwajaleen Atoll

- ✓ 37 *Pennisetum polystachyon* L.
very local in patches near

- ✓ 88 *Paspalum setaceum* Vahl.
common

- ✓ 39 *Euphorbia glauca* (Mill.) Wheeler
common locally

- ✓ 4 90 *Cyperus prostratus* Rottb.
local

- ✓ 4 91 *Pluchea indica* (L.) Less.
common

- ✓ 1 92 *Pluchea odorata* (L.) Can.
common

- 4 93 *Pluchea*
several plants in small
colony with #394-91 and 94-92

- ✓ 1 94 *Euphorbia maculata* L.
one plant seen

- ✓ 1 95 *Lespedeza canna* (Gmel.) sub. Th.
very common

May 5 - same

- ✓ 96 *Actyloctenium aegyptium* (L.) Richt.
locally common

- ✓ 97 *Cyperus rotundus* L.
locally common

prostrate, forming mats
flowers white

prostrate, flowers
reddish purple
spreading to ascending
erect, arching at apex
ascending to erect.

erect shrubby branched,
1 dm. tall, flowers rose pink.
shrub 1 dm. high
flowers purplish gray
prostrate shrub
much branched, flowers
purple
prostrate, olive green
with spot in leaves

erect, decumbent, spreading
slightly ascending

37412

large

✓ 3 99 *Digitaria cilianis* (Ritz.) Kord.

✓ occasional

✓ 19412 *Portulaca* in bloom v. Pollen.

✓ locally common

✓ 01 *Portulaca oleraceus* L.
very common

very small,

prostrate, stem to ground.
calyx somewhat ascendingprostrate, fleshy, flowers
yellowprostrate, fleshy, brownish
flowers yellow almost
cor. mar. stamens 2-3

1903

Virginia

May 3 - part fall of 1902

Thomas

Rocks overlooking fall:

c. *Mypodolites* - greenc. *Hebe* - *autotellus*c. *Hebe* - *americana*L. *Lonicera japonica*c. *Campsis radicans**Arastum**gigina**Plantago lanceolata*

Open part of park

c. *Hebe**Anthoxanthum odoratum**Petula nigra**Platanus occidentalis**Rhododendron tulipifera**Parocaulium vulgare**Plantago rugelii**Stellaria media**Galium aparine**Calluna vulgaris**Trifolium arvense*Wooded flats along road
Stellaria graminea
Galium aparine
*Salix humilis*Common *Stellaria*
of *Cerastium*
from *Salix*

(Hairy)

Petula nigra
Platanus occidentalis
Rhus typhina
Lonicera xylosteum
Menispermum canadense

Mountain - Great Falls of Sta.
Thomas

Rocks overlooking falls -

c. *Myosotis* - green

c. *Linum catharticum*

c. *Hemlock* - green

c.

c.

LAKE MOHONK MOUNTAIN HOUSE

MOHONK LAKE • NEW YORK

Trifolium arvense v. *folia*

Wooded flats along canal

Stellaria graminea

Galium aparine

Salvia lyrata

Pipera hederacea

Phacelia

Phlox divaricata

Stellaria media

Alliaria

Smorhiza longistylis

Podophyllum peltatum

Lindera benzoin

Parthenocissus quinquefolia (hairy)

Geranium officinale

Crataegus europaea

Aster

Aster

Aster

Ranunculus americanus

Stellaria pubera

Galium obtusifolium

Rumex crispus

Carpinus caroliniana

Cornus florida

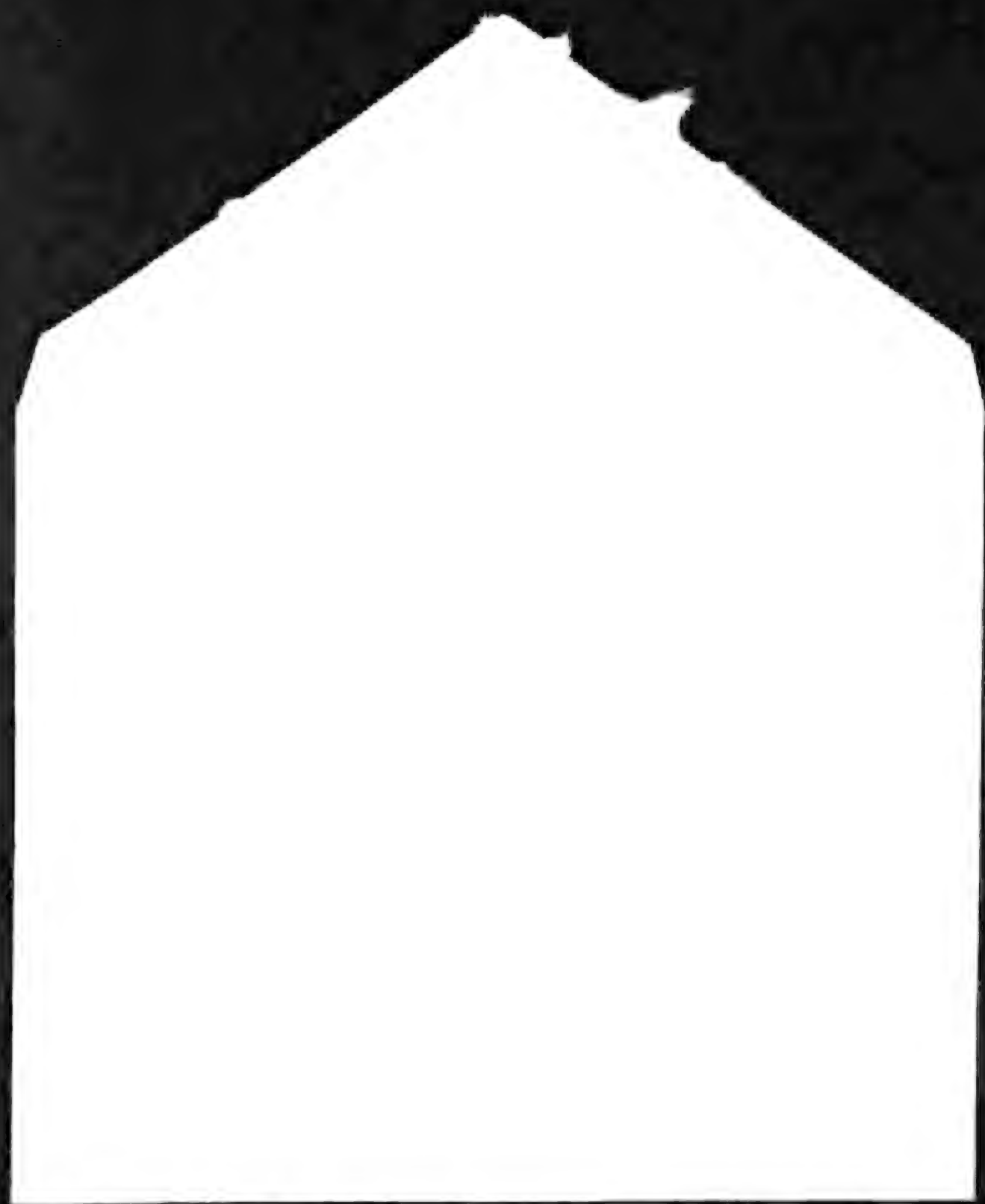
Betula nigra

Platanus occidentalis

Alnus incana

Lymnocarpus foetidus

Menispermum canadense



May 3 - Great Falls of Sta.
Potomac

Rocky overlooking falls -

- c. *Thymus virginicus*
- c. *Thymus occidentalis*
- c. *Hebe americana*
- c. *Lonicera japonica*
- c. *Ceanothus americanus*
- Geranium*

Lychnis

Lantana lancolata

Open part of park

Asimina

Gnaphalium coloratum

Petula nigra

Platanus occidentalis

Hamamelis virginica

Prunella vulgaris

Lantana rugellii

Stellaria media

Salvia lyrata

Parthenocissus quinquefolia

Trifolium arvense

Wooded flats along road

Stellaria graminea

Galium aparine

Salvia lyrata

Pepita hederacea

Phacelia

Phlox divaricata

Stellaria media

Alliaria

Samolus longistylis

Podophyllum peltatum

Lindera benzoin

Parthenocissus quinquefolia (Linn.)

Geranium officinale

Crataegus punctata

Cirsium

Asimina

Urtica

Ranunculus americanus

Stellaria pubera

Galium obtusifolium

Smilax hispida

Carpinus caroliniana

Cornus florida

Petula nigra

Platanus occidentalis

Abies balsamea

Symphoricarpos foetida

Menispermum canadense

May 30 - Between Perryville
and Aberdeen, observation
from train window

On west side of the
Pennsylvania Railroad
an open, cultivated
gently rolling land
are shallow depressions
without outlets, with
standing water, or
dry with vegetation
contrasting with the
grain in the surrounding
fields. Origin of these
and of the surface
stage not obvious.

June 21 Great Falls

Salvia lyrata	7 p.
Elephantopus scutellariifolius	7 p.
Allium vineale	7 p.
Celastrus scandens	7 p.
Achillea millefolium	fl.
Lyssimachia ciliata	fl.
Polygala	7
Staphylea trifoliata	fl.
Asimina triloba	7
Penstemon	fl.
Galium obtusifolium	fl.
Heimerocallis fulva	fl.
Rosa carolina	fl.
Aster (Leucocarpus)	fl.
Viburnum prunifolium	7 p.
Lonicera japonica	fl.
Quercus stellata	7 p.
Rhus canadensis	7
Galium villosum	7
Cornus	7
Lepidium virginicum	fl.
Ilex verticillata	fl.
Viburnum dentatum	7 p.
Scutellaria integerrima	fl.
Scutellaria ovata	fl.
Vaccinium stemmum	7 p.
Vaccinium vacillans	7 p.
Silene antirrhina	fl.
Triodanis perfoliata	fl.
Polygala	7
Quercus phellos phellos	7
Parthenocissus quinquefolia	fl.

anthonia spicata (top of cliff)
Clematis (Vienna)

Vinetomum

Stipa

~~Medicago officinalis~~~~Flax~~

Melilotus officinalis

Melilotus albus

Stelea trifoliata

Celtis occidentalis

Dioscorea quaternata

(lvs. green beneath, 3 at lower node)

Staphylea trifoliata

~~Staphylea trifoliata~~ (lvs. deciduous)

Cryptotaenia canadensis

Alliaria

Circaea quadriseulcata

Dodecatheon media (lvs.)

Clypeus virginicus

Hypoxis

woods

- June 21 - Great Falls of the Palomae
rocky flat above river
39502 *Polygala obtusata* f. ~~obtusata~~ *obtusata* Blake
sandy semi-open spots on
03 *Ilex decidua* Walt.
in wooded

June 22 - 1st Civil War fort on
Union Mill Rd. about 1 mi.
south of Centerville
Flat land covered
by cut-over woods, mostly
deciduous, with scattered
Pinus virginiana and *juniperus*
virginiana. Trees mostly
about 1 dm. or smaller dbh, but
occasional larger ones
3-4 dm.

Well preserved earthworks of
old fort extend for some distance.
Pinus strobus seedlings, planted
in rows along fortification, 03-

5 ~~herbaceous~~ ground layer
herbs and subshrubs
Vaccinium vacillans
Fraxinus, *Carya* + *Quercus*
seedlings
Galearia hypericoides
Lanibum sp.
Urtica dioica laevigata
Galium circaeazans
Hedysotis purpurea
Centella asiatica integifolia

flowers now pink

arching shrub to 3 m. tall,
several to many stemmed,
recently sending up root sprouts.

Bypassed Fort

There is a nice quiet, pic-
turesque tract of wooded
land, approximately 100
acres, alongside Old Union
Mill road, Route 659, in Fair-
fax County, Va. The location
is about one mile and a half
south of U. S. Route 29-211
and about 21 miles from
Washington.

This site is one of the few
remaining Civil War forts in
the Washington area. Like a
silent sentinel the old forti-
fications meander along from
the north southward across
the wooded landscape and
about 125 feet west of the
Union Mill road. These for-
tifications are well preserved
and are visible from the road.

The Old Union Mill road
formerly extended to the
railroad, which is about three
miles south of the fortifica-
tions. This is believed to
have been one of the most
important fortifications
guarding the Federal City and
adjacent Northern Virginia
territory held by the Union
Army.

The property is available
for purchase as parkland, at
this time at less than one-
sixth of the cost per acre
that was approved by the
Board of County Supervisors
for the purchase of the 15-
acre Fort Marcy tract. In
another section of the county.

Observer

forest is now essentially
a story forest -
attained large emergents
mostly *Quercus alba*
and *Carya* spp.
as *Liquidambar*

in canopy layer 15-20 m.

gully *Carya* spp.
Quercus alba
Pinus virginiana
Liriodendron virginicum
Fraxinus americana

understory 2-6 m. tall
Pinus florida
Cecis ~~obtusata~~
acer rubrum
Quercus alba

4) shrub layer ± 1 m. tall
saplings of above broad-leaved
species.
Prunus sp. (cherry)

June 21 - Great Falls of the Potomac
rocky flat above river

39502 *Polygala obtusata* f. ~~obtusata~~ ^{obtusata} Blake
sandy semi open spots on

03 *Ilex decidua* Walt.
in wooded

June 22 - 1st Civil War fort on
Union Mill Rd. about 1 mi.
south of Centreville

Flat land covered
by cut-over woods, mostly
deciduous, with scattered
Pinus virginiana and *juniperus*
virginiana. Trees mostly
about 1 dm. or smaller dbh, but
occasional larger ones
3-4 dm.

Well preserved earthworks of
old fort extend for some distance.

Pinus strobus seedlings planted
in rows along fortification, 03 -

5 ~~leaves~~ ground layer
herbs and subshrubs
Vaccinium vacillans
Fraxinus, *Carya* + *Quercus*
seedlings

Geocymum hypericoides
Sanicula sp.

Aureolaria laevigata

Galium circaezans

Hedysotis purpurea

Centella integrifolia

flowers rose pink

arching shrubs to 3 m. tall,
several to many stemmed,
apparently sending up root sprouts.

The forest is now essentially
a three story forest -
1) scattered large emergents
mostly *Quercus alba*
some *Carya* spp.
a few *Liquidambar*

2) open canopy layer 15-20 m.
tall.

Largely *Carya* spp.

some *Quercus alba*

.. *Pinus virginiana*

.. *Biospyros virginiana*

Fraxinus americana

3) understory 2-6 m. tall

Cornus florida

Cecis ~~canadensis~~ ^{canadensis}

Urtica

Quercus alba

4) shrub layer \pm 1 m. tall

saplings of above broad-leaved
species.

Prunus sp. (cherry)

Pantherocnemis quinquefolia
Pantheria spicata
Aster spp. (not in flower)
Rosa carolina
Hypericaceae quadrifolia
Erilacina racemosa
Dioscorea quaternata
Rubus sp.
Desmodium spp.
Hypoxis aurea
Pyrolanthus sp.
Solidago spp.
Carex stellata ?
Scutellaria ovata

Ditches along the fortification
 in woods with, practically
 no aquatic or semi-aquatic
 plants. In one area where
 ditch approaches road
 and is open there is an
 abundant growth of
Carex

Juncus effusus
Scirpus
Juncus sp.
Najas advena

June 22 - about 1 mile south of
 Centerville

is rather thin second growth mixed woods.

39504 *Pantheria spicata*
 occasional

Cumula origanoides
Anemone thalictroides
Erilacina glauca
Loricea japonica
Vitis spp.
Hieracium venosum
Oxalis
Antennaria plantaginifolia
Potentilla simplex ?
Hedysotis coerulea
Carex campitris ?

Beyond here, where
 ditches are on the edge
 of the woods the bottom
 of the are away from the road
 has a thin growth of
Sphagnum but with
 none of the normal
 associated bog plants
 except occasional colonies of
Ludwigia linearis. The
Sphagnum here is well
 established.

- 7940 Hedysotis aculea
occasional to common
- 18 Carex
common
- 19 Carex
common
- 20 Hedysotis purpurea
common
- 21 Santellaria integrifolia
rare
- 22 Carex
occasional
- 23 Galium pumilum
occasional
- same - in standing
water in the ash of old
pot, in sunny opening.
- 24 Lamps
occasional
- 25 Carex louisianica Bailey
abundant
- 26 Juncus
large colony
- same - in open pine woods
along road
- 27 Asclepias variegata L.
rare
- 28 Rosa carolina L.
common
- 29 Santellaria integrifolia v. integrifolia
common

culms solitary to small
tufts.

small tuft, culm slender, erect.

mostly in young fruit,
occasional plants with heads of
flowers blue. heads
two white marks on palates
of lower lip.

small tuft of culms
erect.

culms solitary, erect,
fruit immature.

culms erect, solitary,

erect, heads brown

flowers white except
bright purple base of corona
flowers bright purple, fragrant.

erect, flowers blue violet
with two white marks on palates
of lower lip.

39813

Scutellaria ovata (L.) Raf.
occasional but very
local (with common blue
mauve form.)

- June 27 - Big Meadows ^{Pine} Ground
Shenandoah Park
19 *Botrychium virginicum*
open grassy woodland

June 27 Elk Wallow Pine ground
Shenandoah National Park
in mixed pine and oak woods

- 4 20 *Bromus sterilis* L.
small colony several m.
across.
21 *Hellaria medea*
occasional

June 28 Big Meadows Pine Ground
Shenandoah National Park

- 22 *Dunnstaedtia punctilobula*
common in shade of scrubby
forest on very rocky gentle slope

erect; flowers tinged
with pink, with the
inner whorls more
palely of lower lip.

fertile part of frond
~~sterile~~ fertile.

spreading, semi-prostrate.

fronds light green, almost erect.

July 4 - Timberlake,
west of Vienna

- 39523 *Potamogeton dispersus*
small colony in small pond.
- 24 (grass) *Festuca obtusa*
occasional in wooded bottom-land along stream
- 25 *Athyrium filix-femina*
common in wooded bottom-land along stream.
- 26 *Galium ~~oblongifolium~~ ^{triplicatum}*
common in wooded bottom-land along stream
- 27 *Panicum*
common on slope of earth dam in full sun
- 28 *Panicum*
on disturbed ground along road in woods, shaded
- 29 *Carex*
on disturbed ground along road in woods, shaded

July 5 - Woodstock Observatory,
ridge on west boundary
of Fort Valley
granite ridge
covered by mixed
hardwood forest -
Tilia, *Quercus rubra*,

leaves floating.

culms almost erect
tops nodding.

sterile fronds spreading
ascending, fertile fronds
erect.

roots deep yellow;
stems prostrate.

culms in small tufts,
erect, spikelets purple.

culms ascending.

culms in loose tufts
spreading, practically
decumbent.

Quercus prinus, *Prunus
serotina*, *Carya* sp.
Robinia pseudo-acacia,
etc. on rocks *Spiraea
latifolia*, *Aureolaria laevigata*,
Polypodium vulgare, *Woodia
oblonga*, *Protophys marginalis*,
Asplenium platyneuron, etc.

4

July 5 - Fort Valley,
at intersection of main
road and Woodstock Rd.

Road cut in Devonian
shale. Fossil brachiopods
abundant, in thin layers.
Some ferns - Cheilanthes
and Asplenium on ledges
and in crevices.

July 5 - Elizabeth Furnace
Fort Valley, Massanutten
Mts.

Flat valley bottom
covered by cut-over
woods, mostly small
hardwood, some
Pinus virginiana,
a little *P. rigida*. The
larger pines mostly
recently cut out.

Bottom-land along
Passage creek rather
densely wooded,
little undergrowth
except occasional
Smilax.

Passage Creek here is
about 6 m. wide, with a
rocky bed with gravel
between the rocks. In
shallow places are large
colonies of *Jussiaea americana*,
about 3-4 dm. tall, in flower.

Clumps of *Alnus serrulata*
3-5 m. tall hang over the
banks. Above this is
Carpinus, *Acer rubrum*,
etc. In the stream
are two of what appear
to be fresh water Rhodophyceae.
One is a coarse filamentous
greenish plant up to 5 cm.
long, with conspicuous
nodes. The other a
brownish gelatinous
thallus, broadly linear,
crisped, growing in
clumps on rocks and
pebbles, frequently small
clumps on backs of
snails.

The level of the stream
at this time is about 2 m.
below the level of the flood
plain.

July 26, Great Falls Park
Ground generally wet.
streams flowing in
small ravines.

Phlox paniculata in flower
Rabbit, ~~and~~ wood thrush,
crow seen.

July 27 - Little Stony Man trail, 3300'
Shenandoah National Park 2000'
39530 *Galium* procumbent
common in thick ~~oak~~ hardwood
forest on east slope.

July 27 - Dickey Ridge picnic
ground
on rocky outcrop in
thin woodland

39531 *Galium*
common

32 *Scutellaria*
uncommon

Plant communities in
SNP. That should be described:

Hemlock groves

Shale cuts

Greenstone cuts

Red oak forest

Chestnut oak forests

earth banks along road

Woods

Myrica

procumbent

procumbent, elongate

leaves dark green; flowers
blue-violet with two
white marks on palate.

Meadows

Brown thickets

Wet oak scrub

Hardwood coveys

Scrub oak - No. 1 forest

Pine woods

~~Aug~~ July 31 - 71 st. and P. Hts N.W.
Washington

(9933) *Lolium perenne* L.
between sidewalk and curb

71 st. + P. N.E. corner bet.
sidewalk and curb, nearly
full sun (a), another short
section, more shady (b)

	(a)	(b)
<i>Setaria viridis</i>	c	
<i>Lepidium virginicum</i>	c	c
<i>Digitaria aschaeum</i>	c	c
<i>Polygonum aviculare</i>	c	o
<i>Cucumis indica</i>	c	
<i>Plantago rugelii</i>	o	o
<i>Polygonum pennsylvanicum</i> (?) sterile	o	
<i>Lolium perenne</i>		o
<i>Tridax flavus</i>		c

Aug. 1 - Pinefields Shanty
second-growth broad-leaf
forest.

- 39534 *Scutellaria serrata* Andr.
small dense colony in
opening in small draw

Aug. 1 - Appalachian trail
north of Pinefield Gap
old field with small
trees.

- 35 *Diodia teres*
local along trail
36 *Parthenocissus quinquefolia*
common climbing on
bushes and trees

Gentle slopes and rounded
low ridges, grassy with
irregularly scattered ~~low~~
young trees, mostly *Robinia*
but locally *Pinus rigida*.
P. pungens, *Crataegus unsyallii*
some *Lassapras*. Two species
of *Rubus*, one erect (*R. argutus*?)
and one low, locally abun-
dant, esp. the low one. Many
herbs in grassy area -
Chrysanthemum leucanthemum
Linaria vulgaris *Rudbeckia*
hirta, *Triosteum* (but *perfoliatum*
and *aurantiacum*), *Asclepias*
syriacum, *Scrophularia*

scapitose, 3-6 stems
in a clump.

flowers lavender.

woody vine, leaves
glaucous beneath.

Aug. 2 - Paine Run Fire Rd

Pine oak woodland

Moderate slope facing north, with scattered *Pinus rigida* and *Quercus falcata* spaced unevenly, crowns from touching to about their own width apart, mostly 10-15 m. tall, pine trunks up to 2 dm. dbh. A few small *P. virginiana*.

A layer 2-3 (4) m. high of *Quercus ilicifolia*, *Hammamelis*, and *Kalmia* with some *Castanea pumila*, *Nyssa sylvatica*, and *Sarcocornus* ^{*Castanea dentata* sprouts} and oak saplings, forming a rather continuous but not very dense scrub.

Under this a layer 0.5-1 m. tall of *Gaylussacia baccata*, *Vaccinium vacillans*, *Menziesia*, *Kalmia latifolia*, *Vaccinium stamineum*, *Pteridium*, *Asplenium*, ^{*Solidago* spp. *Myrica pensylvanica* (2)} *Asplenium*, ^{*Nyssa* oak *Sarcocornus*, *Acer rubrum*} *Asplenium*, ^{*Castanea dentata* sprouts} forming a dense scrub.

Ground layer very sparse, of *Galium aparine*, *Epigaea repens*, *Vaccinium vacillans*, *Humaphysa maculata* (2), *Baptisia tinctoria* (in thin spots), *Lycopodium complanatum*, *Spiraea*

1600-1700'

1500'

~~Stat.~~ *Betula papyrifera*, *Iris cristata* (2) (3)

Paine Run - rocky bed of stream running across transverse tilted shale beds with crevices. *Polytrichum* and a number of other mosses forming cushions and mats in crevices. Higher plants in crevices characterized by long dense root systems.

- c *Panicum* at least 3 or 4 spp.
- o *Carex* spp.
- c *Achillea millefolium*
- c *Aster cordifolius*
- c *Eupatorium purpureum*
- c *Hypericum montanum*
- ~ *Campanula*
- Aster lateriflorus*?
- Viola* sp.
- o *Demissaedia parvifolia*
- o *Alnus incana* (sprout)
- ~ *Platanus occidentalis* (seedling)
- o *Betula lenta* (seedling)
- o *Hydrangea arborescens*
- ~ *Nyssa sylvatica* (seedling)
- o *Juncus*
- ~ *Menziesia pilosa* (seedling)
- o *Lysichiton* (seedling)
- ~ *Kalmia latifolia* (seedling)
- ~ *Solidago* sp.

Plants in crevices are mostly mosses, but some are higher plants.

Aug 2 Trayfoot Mt. Trail
up from Pine Run.

1600'

Medium east slope with
broken quartzite abundant
in soil. Low forest
mostly *Quercus*
marilandica about
5 m. tall with scattered
small pines to 10 m. tall
some *Quercus ilicifolia*
Kalmia, *Sassafras*, *Amelanchier*
arborescens, *Nyssa*, *Carya* etc. Shaking up
a very sparse ~~see~~ under
story 2-3 m. tall.

Dense lower story 0.5-0.6 m
tall of *Gaylussacia baccata*
and *Vaccinium vacillans*
in open spots. *Tephrosia*
virginiana, *Baptisia leucostachya*.
This is very distinctive
but rather restricted. Probably
represents an old severe fire.

Above this, at perhaps 1150'
is denser forest about 15-20 m.
tall, of *Nyssa*, *Carya* sp., *Quercus*
prinus, *Q. coccinea*, *Cornus*
florida, *Diospyros*.

Scattered seedlings to 1 m. or more
tall of *Sassafras*, *Cardinalis dentata*
sprouts.

Moderately dense ground
layer of *Vaccinium vacillans*.

seedlings of *Sassafras*, etc.
This thick out to almost nothing
where quartzite talus is abundant.

2100'

Lower end of ridge of
Trayfoot Mt. is a quartzite
outcrop with low
sparse scrub of *Quercus*
marilandica, *Pinus virginiana*,
P. rigida, *Rhus copallina*,
Robinia pseudo-acacia,
Rubus arguta, *Quercus ilicifolia*,
Q. prinus, *Carya* sp., *Acer*
rubrum, *Amelanchier*
arborescens (?), etc. *Vitis* (*glauca*?)
Danthonia spicata in openings.
On quartzite *Umbilicaria*
is abundant, *Polypodium vulgare*,
Tephrosia, *Carex* sp., *Spiraea*
betulaefolia, *Vaccinium*
vacillans, *Potentilla simplex*?
in openings, also *Paronychia*
virginiana var., *Phlox ovata*
rare. *Heuchera*.

2200'

-2700'

Above this low mixed
forest, oaks, pines, *Sassafras*,
etc. In this on ridge several
very small openings where
all trees have died, dead
sticks still standing or
bent over. No apparent
reason. Possibly all were
Sassafras, or *Quercus montana*,
and were killed by a disease.

Aug. 2 - Skyline Drive, head of
Indo Hollow just s.w. of Browns Gap

34557

Salix caroliniana Michx.
on talus below road

Aug. 2 - Skyline Drive, Doyle River
Overlook.

roadside, in hardwood forest

38 *Carya glabra* (Mill.) Sweet
common

39 *Quercus velutina*
common

40 *Polygonum convolvulus* L.
abundant on

41 *Hedyotis purpurea* v. *longifolia*
occasional on

42 *Tragopogon pratensis* L.
occasional on

43 *Mentha spicata* L.
abundant on

Aug. 2 - Paine Run, Augusta Co.
in seepy place along road in
hardwood forest

44 *Eleocharis*
rare

45 *Scirpus polyphyllus*
common

46 *Scirpus cyperinus* (L.) Kunth.
rare

47 same - in crevices in open
rock bed of stream

47 *Panicum*
occasional

7501

shrub 1.5 m. tall.

7953

8222

tree about 10 m. tall,

fruit immature
low spreading tree, 8 m. tall

ascending, old leaves reddish.

corolla bright lavender.

flowers yellow.

aromatic herb; flowers
pale lavender.

~~partial~~ peduncles
curving upward.
erect, heads pendent

39548 *Carex*

1 rare

49 *Panicum*

common

50 *Panicum*

rare

51 (grass) *Agrostis peruviana*

rare

52 *Panicum*

occasional

53 *Carex*

occasional

54 *Panicum*

occasional

55 *Juncea tenuis* f. *monostachya*

common

56 *Aster divaricatus* L.

common

57 *Campanula divaricata*

rare

58 *Hypericum mutilum* L.

Aug. 2 Trayfoot Mt. Trail,
Left hand hollow, Augusta Co.
in mixed pine and hardwood
forest

59 *Galium pilosum* Nutt.

occasional in thin places

60 *Hedyotis purpurea* var. *tenuifolia*

common

61 *Galium circaezans*

common

62 ~~*Phlox ovata*~~ *Penstemon brevisepalus*

occasional

densely caespitose,
culms prostrate &
ascending, 1 m. long.

densely caespitose, culms
ascending, spikes pendent.

Fls. pale lavender to white,
disk yellow.

~~pale~~ flowers pale
blue-lavender.

stems ascending

39523 *Panicum*

occasional

4 64 *Chenopodium umbellatum*
local on flat ground near stream1 65 *Monotropa uniflora* L.
rare, on flat ground along stream2 66 *Oxycorymbus hypericifolius* (L.) W. & A.
occasional on steep slope
apparently burned over at
some time.1 67 *Leschea minor* L.
very local on steep burned
slope.Aug. 2 - southwest ridge
of Trayfoot mt.3 68 *Asclepias verticillata*
occasional in open
scrubby woods.2 69 *Clitoria maritima* L.
occasional in woods4 70 *Aralia hispida*
local on ledges of quartzite
outcrops in open.

71

same, rock ledges on
west side3 71 *Carex*
shaded3 72 *Quercus rubra*
common73 *Ribes rotundifolium* Michx.
rare on

1500'

leaves glossy.

↓

prostrate; flowers
yellow, petals 4, tending
to be in pairs.

flowers white.

stems ascending; leaves
dark green, flowers lavender
purple.erect, suffrutescent herb
up to 0.2 m. tall, ripe fruit
bluish black.

caespitose, spikes drooping

- 39575 *Panicum boscii* Poir
local on ridge in woods
76 *Scutellaria*
rare on great rocks

Aug. 3 - South River picnic ground
on roadsides

- 77 *Lactaria viridis* var. *weemanni*
(R+S) Beas
common
78 *Lactaria viridis* (L.) Beas.
occasional
79 *Lactaria geniculata* (Lam.) Beas.
occasional
80 *Galinsoga ciliata* (Laf.) Blake
abundant

- Aug. 3 - Pinefields Gap
81 *Galium*
local in old-field thickets

caespitose

flowers white.

spikes green

spikes greenish

spikes yellowish

rays white

forming dense tangle,
stems 1 m. or more long,
flowers cream-white,
4-parted.

Aug. 5 - Washington
New Hampshire Ave. between
N and 2 N.W.

Former lawn between
sidewalk and curb - 3
sections of 50', one 6', other 50' ±
rather well shaded.

	50'	6'	50'
<i>Taraxacum officinale</i>	c	o	~
<i>Trifolium repens</i>	a	✓	c
<i>Plantago rugelii</i>	c	c	o
<i>Plantago lanceolata</i>	o	o	c
<i>Poa annua</i>	c	✓	a
<i>Polygonum persicaria</i>	o		
<i>Polygonum aviculare</i>	o	✓	o
<i>Eleusine indica</i>			o!
<i>Lactuca viridis</i>	o	c	o
<i>Muhlenbergia schreberi</i>	o	c	
<i>Bidens bipinnata</i>	~		
<i>Lepidium virginicum</i>		~	~
<i>Digitaria sanguinalis</i>	c		a
<i>Ailanthus altissima</i>			seedling

Aug. 5 Washington

N 4th. N.W. bet. New Hampshire Ave
and 21st St. thin shade,
in 3x6 spaces around trees
next to curb. n. side of st.
from e. to w.

<i>Chenopodium ambrosioides</i>					~
<i>Lactuca viridis</i>	a	c	a		
<i>Polygonum aviculare</i>	c	c	c	~	o
<i>Plantago lanceolata</i>	~				
<i>Ulmus</i> sp.	inf.				
<i>Euphorbia supina</i>	o				c
<i>Lepidium virginicum</i>	c		o	o	o
<i>Trifolium repens</i>	~				c
<i>Digitaria sanguinalis</i>	o	o	c	a	c
<i>Trifolium repens</i>		c	a	c	c
<i>Plantago rugelii</i>		c	~	c	c
<i>Muhlenbergia schreberi</i>		c			o
<i>Panicum ^{hirsutum} capitatum</i>		c	~		c
<i>Chenopodium alba</i>			~		
<i>Bidens flava</i>				o	c
<i>Viola</i> sp.					~
<i>Eleusine indica</i>					o
<i>Poa annua</i>					o
<i>Oralis corniculata</i>					~

Aug. 6 - Great Falls

Flats between old road and the foot of slope up to entrance road, beyond the horse trail running up to the entrance road and beyond the easternmost picnic ground road are mostly swamp.

The swamp has

Arisaema triphyllum
Sagittaria arifolia
Impatiens capensis
Violes ~~pubescens~~ *willows*
Rubus *penicillatus*
Ilex verticillata
Rhus toxicodendron
Acer rubrum
Symphoricarpos foetidus
Viburnum dentatum
Rubus sp.
Nyssa sylvatica
Cuscuta sp.
Eupatorium frutescens
Smilax rotundifolia
Cornus rugosa
Osmunda claytonii var.
Polypodium virginicum
Calla
Quercus
Cryptotaenia canadensis
Smilax hispida
Thalictrum

Viburnum ~~brunifolium~~
Glechoma hederacea
Parthenocissus quinquefolia
Athyrium sp.
Dryopteris cristata
Najas *saxatilis*
 several grasses and sedges.
~~Oxycoccus~~
Phytolacca americana
 + ~~Lyopodium obscurum~~
 in hummocks.

This swamp lies between the cliff below the road and a ridge of schist along which skirts the old road. At the south end of the swamp is another ridge. These ridges covered by oak-hickory forest.

Aug. 9 - Franklin Cliff
 29-32 | *Polygonum ~~sp.~~* ^{tenax}
 on rock ledge

Aug. 9 skyland
 around resort

83 (cous.) *Hesperis matronalis* L.
 one small colony near trail
 in shade

84 *Picea ~~mariana~~* *mariana* pungens
 planted near cottage

85 *Fagus sylvatica* var. *atlantica*
 planted near cottage

Aug. 9 slopes of Stony Man
 Mountain along Appalachian
 Trail ~~near~~ north of skyland
 in mixed hemlock and
 hardwood forest on steep ^{west} slope

86 *Petula ~~sp.~~* ^{*albiflora*}
 common

87 *Ribes rotundifolia* ?
 on rock cliff

88

Aug. 9 - Little Stony Man Cliffs,
 along Appalachian Trail

88 *Spiraea latifolia* var. *septentrionalis* ?
 common on tops of cliffs

Aug. 9 - Stony Man Mountain
 on wooded summit

89 *Ilex montana*
 in undergrowth

deciduous forest at base

stems, m. tall, mostly
 in fruit; flower purple.

Tree 10 m. tall, blue-gray.

Tree 15 m. tall, slightly
 coppery ~~and~~ green.

small tree, bark yellowish
 gray, wintergreen odor.
 pendent shrub 1.5 m. long.

low shrub 2-3 dm tall.
 flowers white, pinkish
 in center.

slender shrub 2 m. tall,
 fruit immature

- 39590 *Ilex montana*
 2 on edge of cliff
 1 91 *Liatris scariosa*?
 rare

Aug. 9 - Stony Man Mountain
 on open rock cliffs near
 summit, north west side

- 2 92 *Juncus*
 in crevices
 1 93 *Lycopodium* selago
 rare in crevices
 1 94 *Taxus canadensis*
 colony several m. in diameter
 just back of top of cliff
 1 95 *Polygonum ~~saxatile~~ ^{tenax}*
 rare on ledges
 1 96 (fern)
 common in crevices
 2 97 *Carex*
 occasional on ledges
 1 98 *Liatris scariosa*
 common at tops of cliffs

The rocky ledges and
 cliff tops have a character-
 istic community of *Phlox*
subulata, *taxifraga*, *Michauxia*,
Potentilla tridentata, *Dennstaedtia*
punctilobula, *Solidago*
canensis var. *monticola*,
Liatris graminifolia,
Salaginella rupestris,
Deschampsia caespitosa

dense shrub 2.5 m. tall,
 fruit immature.
 stem single, erect; flowers
 bright purple.

low, somewhat ascending,
 fruit immature, reflexed.

almost erect.

caespitose

caespitose, flowers bright
 purple.

Juncus sp., *Carex* sp.
 and rarely, *Lycopodium* selago.
 growing in crevices and on ledges.
 In most localities only
 part of these are present.

Aug. 9 - Rapidan Fire Road
east of Big Meadows
shaly cut bank, 45° slope

Discrete clumps of
Campanula divaricata
up to 1 m. apart.

Scattered *Asplenium*
quadrifolium, scattered
Rubus argutus, a few
tufts of *Sanicula* sp.

Dianthus spicatus, *Hedysarum*
purpureum var. *longifolium*, a few
~~small~~ *Ribes* shrubs, a few
scattered seedlings of
various things.

Above this a gently
sloping completely stony
surface, with scattered
clumps of chestnut and
Picea laricina sprouts -
abundant *Desmodium*,
Asplenium quadrifolium,
Dianthus and *Campanula*
divaricata, also *Aralia*
racemosa, some *Aquilegia*,
Parthenocissus, ~~some~~
Smilacina racemosa,
Vicia pennsylvanica,
Vaccinium vacillans, *Aporosa*
androsaemifolium, *Aster*
sp. not yet in flower, *Ribes*,
Silene, *Lactuca*, a
few oak seedlings of various

sprouts under 1 m. tall.
Smilax hispida, *Dioscorea*,
Achillea, *Yucca aptera*,
Amiantum (red), *Sparganium angustifolium*,
Corylus americana, *Hedysarum purpureum* var. *longifolium*,
Chestnut sprouts fruiting
abundantly.

Aug. 9 - Upper Rapidan Fire
Road, just east of Big Meadows

39599 *Betula lenta*

in open meadows

39600 *Agriemonia gyrocephala* Willd.

in open woodland

4 01 *Bromus*

abundant around old dump

3 02 *Lolium humile* Marsh.

occasional in open woodland

3 03 *Pennisetia pumila*

abundant in edge of

forest on flat ground

2 04 *Phlox*

occasional in very rocky
open ground

3 05 *Pennisetia pumila*

abundant on very

rocky ground in open.

Aug. 10 - Canyon of South River
north side, along Fire Road.
in road, shaded.

1 06 *Polygonum punctatum*

1 07 *X Polygonum dubium*

1 08 *Galium triflorum* var. *asprellum*

Aug. 10 - head of South River Falls
South River

2 09 *Betula ~~sp.~~ alleghaniensis* Brit.

bottom of wooded canyon

bushy tree 8 m. tall

flowers yellow.

~~spike-like~~ panicle
drooping, culms erect.
shrub, many stemmed
from base, to 2.5 m. tall,
shoots 1.5 m., leaves
glaucous beneath
stems erect from
shallowly buried rhizome,
small bushes, fruit immature

stems erect from rhizome
deeply buried between
rocks.

flowers greenish, spikes nodding.
flowers pinkish white.
prostrate; flowers pale green.

tree 15 m. tall, wintergreen
odor when broken, bark
yellowish gray.

Aug. 10 - flats - north of
South River, in detached
area of Seward Park on
left bank of South River Field.
Old fields grown up to
broken thickets of *Robinia*,
Sassafras, *Pinus virginiana*,
Cornus florida, *Pyrus coronaria*,
with some *Rhus typhina*, *P. glabra*,
Pinus strobus, *P. rigida*,
Liriodendron, *Pyrus malus*,
never height but
mostly 5-10 m. *Vitis*, *Partheno-*
cus, etc. common.

Openings with *Fragaria*
and *Rubus flagellaris*
dominant, *Aster ericoides*,
Solidago spp., *Chrysanthemum*,
Leucanthemum, *Prunella*, *Adiantum*,
Daucus carota, *Cirsium*
lanceolatum, etc. common.

Aug. 10 - South River Cemetery
open ground in old weedy
cemetery

- 39610 *Vinca minor*
abundant
11 *Spiraea prunifolia*
common
12 *Miscanthus sinensis*
common
13 *Dianthus barbatus*
common
14 *Pinus rigida*
open old field with scattered trees

prostrate; sterile.

slender shrub 1-1.5 m. tall,
sterile.

large clumps up to 2 m. tall,
with last years panicles.
sterile

tree 3 m. tall.

Aug. 10 - 1 mile north of
South River overlook, on
Skyline Drive

Around old farm site

29415

Lyringia vulgaris -

3

16 *Buxus sempervirens* L.

2

17 *Abies balsamea*

3

18 *Rosa canina* L.

2

19 *Rosa cinnamomea* L.

3

20 *Pyrus coronaria*
common in hedges and
old fields

2

21 (grass) *Arrhenatherum elatius*
roadside

980 m.

small tree 3 m. tall, very
bushy; fruit immature.

~~shrub~~ very dense shrub.

bushy small tree 4 m. tall,

tips of twigs bent down -

diseased or mutant form?

scrambling bush,

leaves dark green, sub-glossy

above, flowers rose-pink.

scrambling bush, leaves

hull above, sterile, very

densely branched low

tree, 1 m. tall, fruits

immature.

suberect, panicles

nodding.

Aug. 21 - Clifton - 7 iassic shales and consequent purplish red soils begin here. Curious ~~erosion remnants~~ or basalt intrusions on boundary Clifton-Little Falls and well into Little Falls, forming a crumpled dissected wooded ridge, quarry and many houses on it. Deciduous forest.

Pellington - pale gray-brown soil. Gallery forest along Pompton River very tall, pines, etc. Flat country w. of river with pale brown alluvial soil with large boulders. Mostly farmed but some small second-growth wood-lots. Largely Acer rubrum, Betula populifolia, some oaks. Extends past Rockaway River. Mostly small farms scattered trees and small bits of woods. Scattered large oaks. High ground to west has several nice patches of woods. Two everts in ponds east of Denville.

Mountain Lakes Borough much mixed woods on low rolling hills.

East of Dover near Rockaway River low hills are of either

glacial material or outwash alluvium. South of Dover in distance are wooded hills or low mountains.

East of Dover some humps of gneiss, etc. sticking up through alluvial material.

Between Dover and Netcong are hills of a hard rock, some parts look like granite, parts darker and denser, cut by dikes. Wooded.

All woods in this part of state are deciduous. Budd Lake, lined with resorts and swimming beaches. 1000+ ft. alt.

West mixed woods on slope. Then a plateau of stony alluvium. Then a series of ridges and valleys running n.e.-s.w. the ridges wooded.

Musconetcong River Valley flat and in farms, bounded by long rounded ridges. Ridges wooded with many cleared fields and pastures, some abandoned, fertile flat ~~at~~ bottom-lands along streams farmed more intensively.

Valley of Pequonnock River

broad flat, in farms.
Ridges on both sides mostly
wooded, especially Mt.
Mishpinoke on n. w. side.

This area is a miniature
"valley and ridge province".
Rocks varied but not well
exposed along highway.
Woods all deciduous, not
a conifer seen anywhere
except cultivated spruces at
Buttville. A few *Juniperus*
virginiana also, wild, at Buttville.

Near Manunkachunk
bluffs of phyllitic shale.
A conifer here that did not
look quite like *Tsuga* - more
like *Larix* but probably not.
Did not get a good look at it.
More just south of Delaware
on bluffs. Possibly *Picea abies*
or *P. glauca*. Otherwise all
deciduous.

Delaware Water Gap -
on south sided steep wooded
slopes interspersed with
bare rock cliffs and scree
slopes. Much more cliffs
and talus on north side.
Great scree slope invaded
by *Betula*, *Juniperus*, etc.

On bluffs forest is mostly
broadleaf, but some conifers
(*Picea*? *Juniperus*? *Abies*?) are and

Probably
Tsuga

Pinus.

On Pennsylvania side
after passing Gap the
conifers form a noticeable
component of the forest -
much *Betula*, some tulip,
Statanus, *Juglans*, *Ulmus*,
Quercus.

Up on Pocono terrace beyond
Stroudsburg, to beyond
Tannersville, a mosaic
of woods, fields, etc. The
woods principally deciduous
but with a considerable
coniferous component.

Conifers - *Tsuga*, *Pinus*. These
more abundant westward.

This country, along the
highway, has a very
manicured appearance.
Fine patch of medium
growth *Tsuga* on left of
turn-off to Pocono at
Swiftwater. Road to
Pocono through much
wilder country, still
some cottages, etc.

Red pine, paper birch, white
pine, black birch, elm,
sugar maple, hickory,
chestnut oak, red maple,
sassafras, red oak, chestnut
sprouts.

Most of this is very ~~young~~

young second growth,
5-8 m. tall with scattered
larger trees. Some much
younger, very bushy.
Some *Pinus rigida*,
with birches, old maple
and oaks. *Q. ilicifolia*,
Viburnum cassinoides,
Populus tremuloides, typical
pine country.

Conifers - *Pinus strobus*,
P. resinosa, *P. rigida*, *Picea*
rubens, *Tsuga*, plus
introduced *Picea engelmannii*,
P. abies, *Pinus sylvestris*, *Larix*
laminata (?) very noticeable
around Porons Pine, but
not dominant. Birches,
Acer, *Populus*, etc. abundant.

Beautiful patch of *Tsuga*
woods west of Porons Lake.

West of this much planting
of miscellaneous conifers
in old fields, more beautiful
old hemlock and hardwood
forest.

Halfway bet. Porons Lake and
Blakeslee a farming area
begins. Then more bushy
woods, conifers and *Populus*
tremuloides. Then much
planting of blue spruce -
for Christmas trees?

The country east of here was

evidently, what 20 years
ago was largely an open
burned over country
dominated by *Spiraea latifolia*.

West of Blakeslee, also,
is scrubby second growth.

Rhododendron maximum
common in woods east
of I. side. All of the
woods here are second-growth
slender, 10-15 m. tall, or
locally to 20 m. Mostly
Betula and *Acer rubrum*,
very few conifers. Red
Triassic shale makes up
the east side of the Lehigh
Valley at White Haven.
West side also.

Between White Haven and
Freeland a broad valley
with orchards, ridges on
sides wooded. Road cuts
in shale covered by
Comptonia peregrina, invaded
by *Betula* spp.

Toward Freeland very
scrubby mixed deciduous
second growth. Much
scrub, principally *Quercus*
ilicifolia, with scattered
trees.

Beyond Freeland are massive
open pit coal mines and
enormous bare culm piles.

39622

Aug. 21 between Freeland
and ~~Hager~~ Ebervale, Luzerne Co.

Echinochloa

desiccating roadside pool
in coal mine area

Southwest of Hazleton
are vast areas of open
pits and culm piles.
Betula is making some
headway invading the
culm piles. Farther on
much older mines,
somewhat wooded, mostly
with small birches.
Beyond Shepton in valley
of Catawissa Creek more
purple Triassic(?) shale.

Aug 22 - Bottomlands along
west branch of Susquehanna
River above Northumberland -
mostly farmed but some
small patches of dense
woods, largely *Robinia* and
Acer saccharinum.

Valley of Buffalo Creek, west of
Mifflinburg - broad rolling
flat bottom, almost all farmed
with hedgerows of trees.
Long ridges on both sides
completely wooded except for
conspicuous bare spots of talus on
north side. Deciduous woods

W. E. of Hazleton

culms spreading to
ascending, spikelets
~~to~~ deep maroon or green.

with considerable conifer
admixture and patches
near the top on south side.
Sharp break in character
of forest about $\frac{1}{2}$ the way
up on north side, probably
corresponding to a change in
slope. The lower third much
finer textured, possibly second growth.

Pennsylvania State forest
on high ground between this
valley and the one where
Woodward is located. Dense
hardwood forest. Nice
picnic ground. Valley to west
very similar to that of
Buffalo Cr., more hilly.

East of State Coll. are
several ridges of bedded
bluish-gray limestone.

From northwest of State College
on top of wooded ridge, looking
northwest or north across
Eagle Creek is a great expanse
of woods, mostly deciduous,
some admixture of conifers.
Valley bottoms with clearings.
(Photos 21-22(1)). From the view.

South, slope of Eagle Creek
Valley covered by dense
second growth forest,
about 10 m. high. trees
up to 15 cm. diam. mostly
much less.

Quercus rubra
Quercus alba
Betula lenta
Acer rubrum
Quercus prinus
Fraxinus americana
Linodendron tedipifera
occasional small *Taxus* & *Pinus strobus*

Thin understory of
Cornus florida, *Acer pensyl-
vanicum*, smaller *Kalmia
latifolia*, ~~small~~ *Betula*
etc.

The cut bank of the
highway grassy but
abundantly invaded by
Robinia pseudo-acacia. The
source of seeds not at all
evident.

Similar woods almost
continuous, except for one fair
sized open area, almost to
Phillipsburg. Being logged
in a few spots.

Moshannon State Forest bet.
Clearfield and Rockton is

dominantly a mixture of
oaks, with occasional
other trees, where it has
not been cut or burned
recently.

Cook Forest State Park
more frequent hemlock and
white pine (several photos).
Remains of cathedral area thrown
by wind - mostly cleared out
by Pa. Dept. of Waters to protect
the public from fires. A few
trees left to show public
what storms do.

Aug. 23 - Lowlands of
Mushkingum River bet.
Coshocton and Dresden
along highway (27)

large areas of
marshland, some
swampy woods and
sloughs, cultivated
fields, hay and maize
on higher areas.

Near Tinaway in a
wooded slough 6 wood ducks.
Many aggressive mosquitos.
Woods along slough
of large elms, *Juglans*,
Catanus, *Populus deltoides*,
Quercus prinus (a very broad leaf
f. *bicolor*), *Acer negundo*,

little
Melospiza

~~and~~ *Prunus serotina*, *Gleditsia*
cruciantha, *Asa saccharum*
in understory, *Asclepias*
reticulata, *Quercus*
imbricaria, etc.

Campanula trachelium
very common in edges
of wood, much rarer
here than in Virginia.

Tall blue and yellow asters
abundant. *Scroph. Vitis*,
and a very large *Polygonum*
sect. *Tinaria* climbing
in edges. *Impatiens capensis*
and *I. pallida* both flowering.

Aug. 24 - ^{2-3 miles} south of Mansfield -
open bottom-land forest, principally
Juglans nigra, with
conspicuous ground layer
1 m. tall of a sunflower.
Fields nearby with
conspicuous stands of
Vernonia.

S.W. of Hartsville outcrops
of bedded limestone on edge
of broad shallow stream-ravine.
Further along where rock
does not outcrop is a beautiful
juniper woodland on
rolling hills which form
the edge of the ravine.

Aug. 26 - southeast of Bloomington,
Monroe Co.

Deeply incised drainage
system of East Creek about
200' relief. Canyon walls
densely wooded - if
woods badly cut over
and composed mostly
of small sized trees,
entirely deciduous -
oak, hickory, with some
trump, much *Lassapae*, etc.
Flat ridge-tops and bottoms
cultivated or pastured.

Soil rather sterile,
first crops after clearing
very good, soon falling
off, this especially on edges.
Bottom lands still rather
intensively farmed, edges
not so much so. much
sumac bush, *Lassapae*,
etc. on abandoned fields.

Near Bloomington is
a rolling outwash plain,
more intensively farmed
but very worn-out. much
land abandoned. Wahl farm
being largely turned into
pasture - very sterile soil
being heavily fertilized, planted
to grass, clover and *Lespedeza striata*.
This being 4' deep, lightly, used as
forest and game preserve.

Aug. 27 - Pine Hills

Gorges cut several hundred feet into a flat plateau of horizontal sedimentary beds.

On the flat upland most of the vegetation is old field thicket with introduced pines.

Where there is good forest it is mostly white oak with some ~~oaks~~ *oaks* *nigra* var. and some *Carya*, some other oaks (f. *velutina*?).

On knife-edge ridges *Melilotus alba*, *Phytolacca virginiana*, and a few of *Monarda fistulosa*, etc.

Generally speaking the plateau is covered by oak-hickory forest with emphasis on oaks and considerable tulip. The slopes and bottoms are covered by beech-maple with abundant hemlock and some white pine, much *Ostrya*, *Carpinus*, etc.

On ~~steep~~ slopes the vegetation is mixed - on ~~flat~~ on gentler ~~one~~ *Fragaria* is very common, mixed with beech, *Urtica* common but no *Maianthemum*. Occasional tulip, red oak, sugar maple. *Mitchella* common.

Steep slopes have hemlock, *Fagus*, *Fagus*, *Ostrya*. Cliffs in places bare.

Dusty ledge under overhanging bed of sandstone has large colony of ant lions. Large dead insects common, fairly large larvae caught and struggling or almost dead.

Bottom-land with *Ostrya*, *Carpinus*, *Fagus*, *Populus deltoides*, *Liriodendron*, *Asimina*, *Platanus*, *Cercis*, *Acer nigrum*, *Cornus florida*,

Finished Kodachrome roll, on entire ~~area~~ roll, started another various views.

Aug. 24 - Kins Hills,

39623

Echinochloa

in road in old field in full sun

- 24

Echinochloa

in road in shade around mud hole

1 25

Hedyotis purpurea var. *calycosa*

on knife-edge ridge on sandstone, almost full sun

Aug. 27 - Wabash National Area,
Sugar Creek, northwest of
Annapolis, to Burke Co.

Partly old second-growth
forest small part old
field with ~~small~~
scattered small sapling
regrowth.

The second growth nature
is indicated by large
Sassafras albidum in
abundance, even though
some oaks and beeches
are up to 1 m. dbh. The
forest is mixed *Quercus*
alba, *Q. rubra*?, *Q. palustris*?
Q. prinus var. *Prunus*
grandifolia, etc. *Ulmus* sp.

Some of the red oaks are
succumbing to oak wilt.

In parts there is an
abundant layer of
Ulmus saplings up to about
1 m. tall, though few seem
to attain more than that size.

FIELD TRIP TO PINE HILLS AND THE WABASH NATURAL AREA, SPONSORED
BY THE ECOLOGICAL SOCIETY OF AMERICA, THE NATURE CONSERVANCY,
AND THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS, ON FRIDAY,
AUGUST 29, 1958

Description of Pine Hills

Smith (1933) has described the geology and geomorphology of Pine Hills, and presents a topographic map of the area. Pine Hills lies within the glacial boundary in west central Indiana, occurring in the Till Plains Section of the Central Lowland Province. The physiographically most striking features of the region are the deeply entrenched meanders with nearly vertical walls of two tributaries of Sugar Creek. In referring to the sharp ridges, or "backbones", thus produced, Smith says, "Without exaggeration, they may be considered as the most remarkable examples of incised meanders in the eastern United States. In fact, although they are exceeded in magnitude by such features in the Rockies, none exceeds them in perfection and in interest." The cause of meanders in such youthful topography Smith attributes to the peculiar effects of weathering and erosion in the Borden formation, this being especially susceptible to undercutting. All the bedrock exposed at Pine Hills is referred to this formation, and is composed mostly of shaly sandstones, only a small portion of which is fossiliferous. Owing to erosion glacial drift is thin to absent in the vicinity of the gorge.

With regard to the vegetation, Friesner and Potzger (1934) have written: "Botanically this region exhibits a larger number of excellent and clear-cut forest ecological areas and associations than any other region in Indiana known to the writers. For example: There are wooded old flood-plain terraces along the meandering streams, where they have cut wider valleys; second terraces or still older flood plains now occupied by dense stands of deciduous forest trees; upland plateaus into which the canyons have been cut; *Pinus-Tsuga* slopes; transition areas between the preceding two; *Tsuga*-covered canyon walls; *Pinus-Tsuga* groves, and *Taxus* associations on north-facing canyon walls where the angle approximates 45 degrees." A vegetation map and quantitative data are presented in this publication. The authors conclude that *Acer saccharum* is the "climatic climax" of this region, *Fagus* being greatly reduced compared to the area of Indiana to the east. *Tsuga canadensis*, here at the western margin of its range in the central states, and *Pinus strobus* are considered as relicts of a changing postglacial climate by those authors. Both these species occupy drier sites than the adjacent *Acer-Fagus* forest, as suggested by soil moisture and evaporation studies in certain other *Tsuga-Pinus* sites in Indiana. Soil pH studies indicate a decidedly more acid condition under the *Tsuga* stands than in adjacent deciduous forest (Potzger and Friesner 1936). The area has doubtless been selectively lumbered in the past, and in fact, one of the backbones ("Mill-Cut Backbone") was excavated at one point in the 1850's to operate a small woolen mill for a few years from the flow of water through the cut. The owners of the land have planted several species of pines on abandoned fields on the upland approaching the gorge.

Literature Cited

- Friesner, R. C., and J. E. Potzger. 1934. Climax conditions and ecological status of *Pinus strobus*, *Taxus canadensis*, and *Tsuga canadensis* in the Pine Hills region of Indiana. *Butler Univ. Botanical Studies* 3:65-83.
- Potzger, J. E., and R. C. Friesner. 1937. Soil acidity and hemlock reproduction in relic colonies in Indiana. *Proc. Indiana Acad. Science* 46:93-99.
- Smith, E. R. 1933. The physiographic features of Pine Hills Nature Study Park, Montgomery County, Indiana. *Proc. Indiana Acad. Science* 42:153-161.

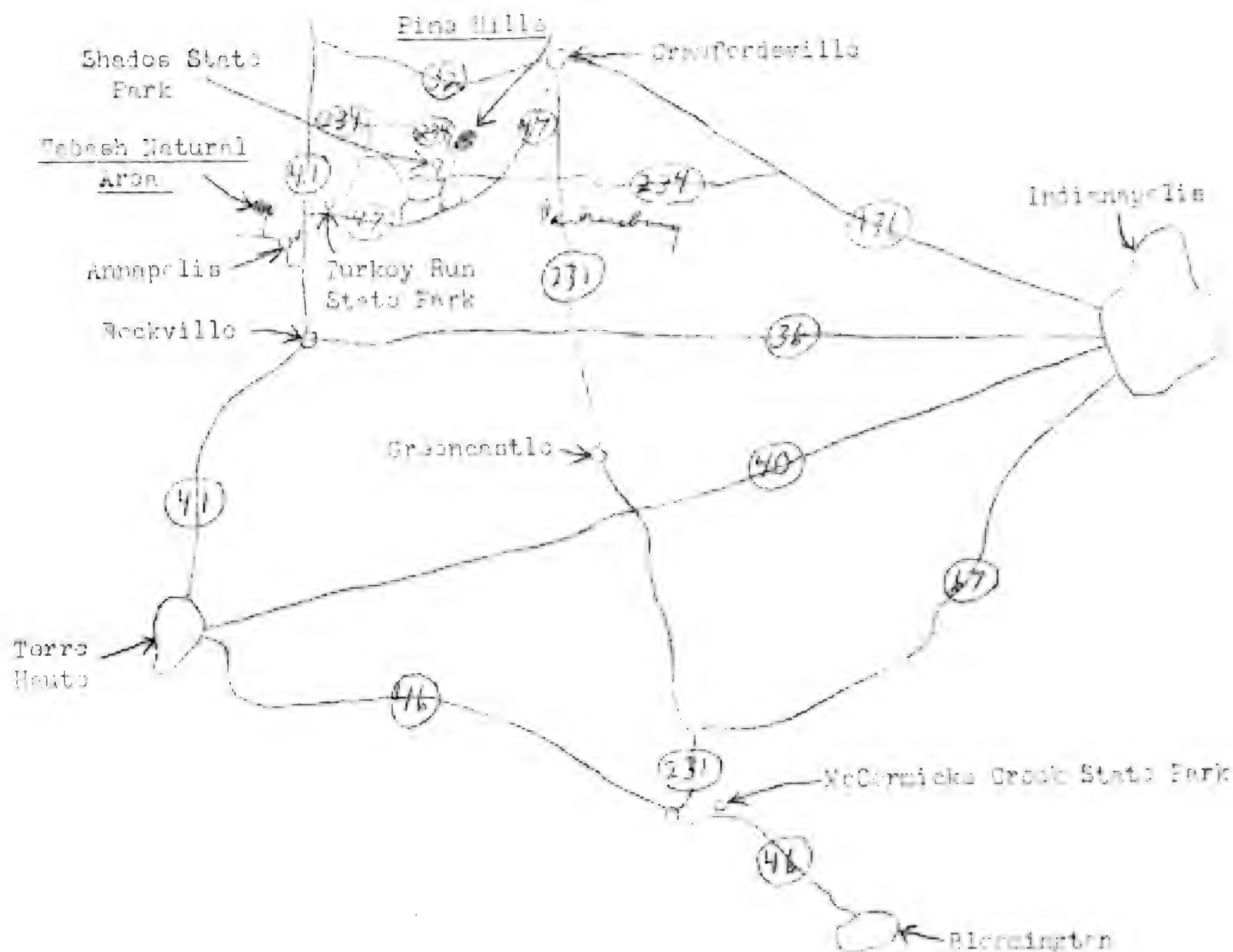
The Wabash Natural Area

Wabash College has recently been given jurisdiction over the late V. C. Allee farmstead, a 160 acre tract of mostly wooded land of rough topography bordering Sugar Creek. Dr. Allee had intended to retire to this area and continue his ecological research, but this wish was never fulfilled. A long-term ecological research program, however, has now been initiated on the property by the staff of Wabash College, under the direction of Dr. Richard Laubengayer. The project is financed by the Atomic Energy Commission, and involves taking as complete an inventory of the biota as possible, together with a detailed analysis of the environment, to serve as a basis for evaluating the effect of fallout on natural and seminatural ecosystems in this region. Several thousand dollars worth of instrumental equipment for microclimatology and soil measurements has been installed, and a laboratory building is being constructed on the premises. In addition to vegetational, microclimate, and soil analyses, such varied projects as rates of decay of wood, the limnology of Sugar Creek, migration of box turtles, old field succession, and the morphology and life history of *Epifagus* are also being investigated. The area and facilities are available to college classes and research workers from neighboring institutions as well as those from Wabash College itself.

IT IS REQUESTED THAT VISITORS NOT COLLECT IN PINE HILLS
OR THE WABASH NATURAL AREA

Field trip leaders: John Felton, Butler University, and Richard Laubengayer, Wabash College.

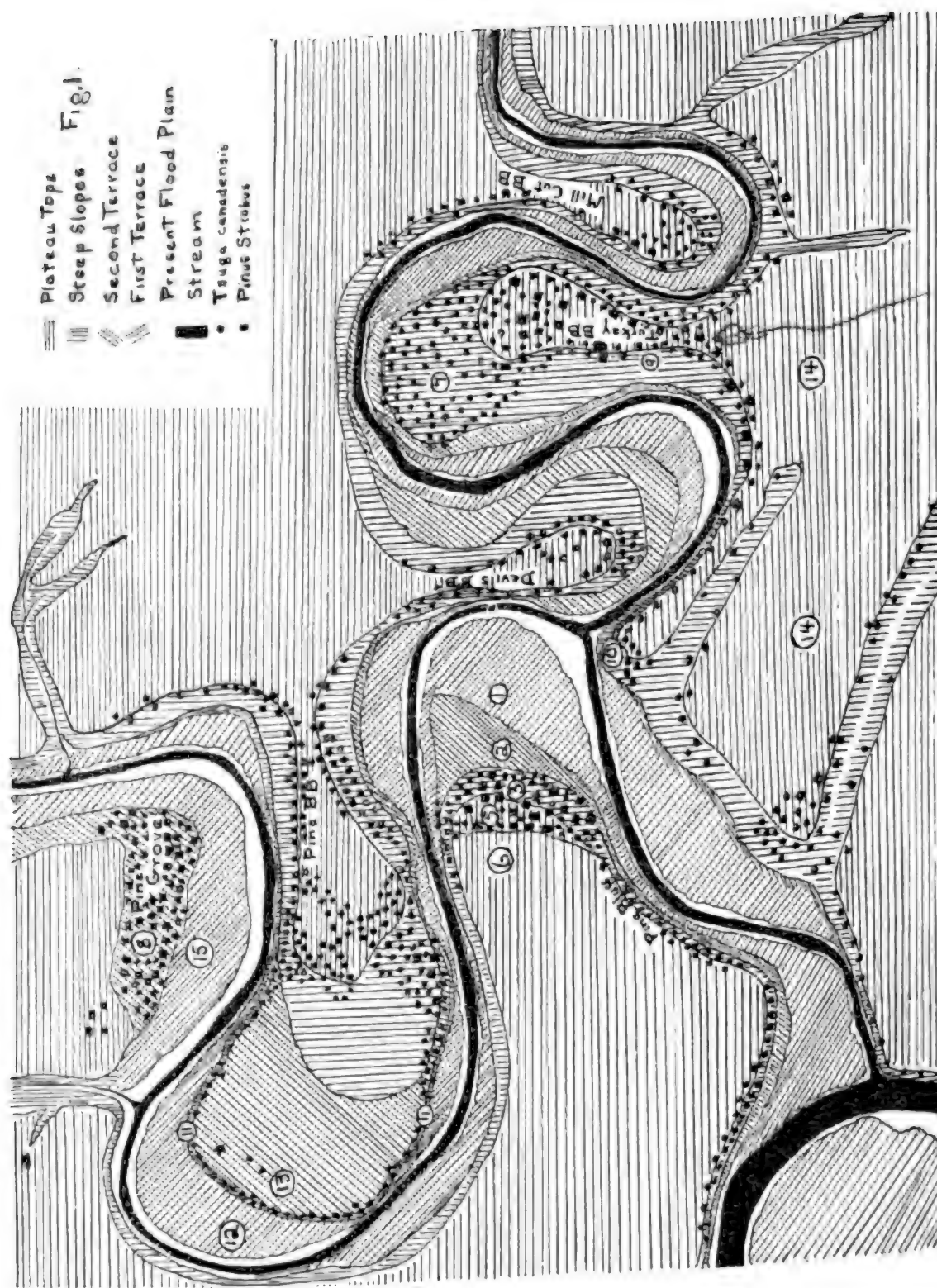
DIRECTIONS FOR REACHING PINE HILLS AND THE YABASH NATURAL AREA



To reach Pine Hills from Bloomington: Take Highway 46 to Spencer; then Highway 231 north to its junction with Highway 234. Turn west on 234 until a sharp turn north occurs in the road one mile east of Shades State Park. Continue north (on 234) for about one mile. A white house and red barn is situated on the west of the road, and cars may be parked here along the roadside. A jeep road extends to the east about $\frac{1}{2}$ mile to the gorge.

To reach the Yabash Natural Area from Pine Hills: Drive south to Highway 47, and then west to Highway 41. Turn south on 41 for about 1.4 miles, at which point turn west (at a Cities Service Station) on the road which will lead to the small town of Annapolis. Continue west on the gravel road leading out of town about 1.5 miles until the second road to the north is reached. Take this road to the Allee farm (0.4 miles). The road to the northwest of there leads to the instrumental stations and wells. Cars should be parked in the field about 0.3 miles from the Allee farmstead.

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culms spreading to west,

culms erect, to 1.4 m. tall.

a small clump, flowers
white.

culm culms is not
abundant in canopy layer.

(note) that the
Wabash College people have
an old field and an woods
and indicate that the relative
humidity and soil
moisture are lower in
the woods than in the
old field.

4 per plants in bush-maple-
oak forest.

Aug. 29 - Pine Hills.

39623

Echinochloa

in road in old field in full sun

24

Echinochloa

in road in shade around outcrops

25

Hedyotis purpurea var. *alpestris*

on knife-edge ridge on sandstone, almost full sun

Aug. 29 - Wabash Natural area,
Sugar Creek, northwest of
Annapolis, La Porte Co.Partly old second-growth
forest small part old
field with ~~small~~
scattered small sapling
regrowth.The second growth nature
is indicated by large
Sassafras albidum in
abundance, even though
some oaks and beeches
are up to 1 m. dbh. The
forest is mixed *Quercus*
alba, *Q. rubra*?, *Q. palustris*?
Q. prinus var. *prinus*. *Fagus*
grandifolia, etc. *Ulmus* sp.Some of the red oaks are
succumbing to oak wilt.In parts there is an
abundant layer of
Ulmus saplings up to about
1 m. tall, though few seem
to attain more than that size

culms sprouting to meet,

culms erect, to 1.4 m. tall.

a small clumps, flowers
white.and *Ulmus* is not
abundant in canopy layer.
Instruments that the
Wabash College people have
in old field and in woods
indicate that the relative
humidity and soil
moisture are lower in
the woods than in the
old field.A few photos in beech-maple-
oak forest.

Sept. 1 - Point Pelee National
Park, Lake Erie, near Leamington

A triangular spit jutting
out into Lake Erie near its
western end. Consists of a
beach ridge on both sides
enclosing low ground with
extensive fords and *Phragmites*?
marshes, these not connected
with the lake. Along the west
side are many lots with
cottages in private ownership,
several fields and orchards.
The slightly higher sandy
ground along the west side
and near the point is covered
by a deciduous forest with
a large admixture of
junipers, mostly tall
rather typical *J. virginiana*
but with also, in open
places, a considerable series
of low ascending and spreading
to prostrate forms, possibly
forming a hybrid complex.
Around the margins
of this forest *Ptelea trifoliata*
and *Rhus canadensis*
are common. *Asparagus officinalis* etc.

Birds are plentiful.

The beach along the west
side of the point is stabilized
by use of very ugly L-shaped
slabs of concrete.

Between Windsor and
Leamington is a thoroughly
agricultural area, on low
broad terraces bordering
the lake. Among crops
noticed were peaches
and a very little tobacco.
The leaves of the latter were
very large and a pale
whitish green. Tomatoes
are produced in great
abundance.

Sept. 2 - East of Leamington.
at least to Blenheim, tobacco
is one of the principal crops,
with maize and tomatoes,
some peaches and plums.

Woodlots are extremely
scarce, somewhat more
common eastward till at
Blenheim and eastward
they are more a part of the
landscape.

Along the shore are cliffs
perhaps 20 m. high,
bounding a very wide
terrace of clay with
small gravel which is
eroding at the edge so
rapidly that there is little
or no vegetation on them (photos).
Along the cliff top the principal
plants are *Solidago* and

aster or low masses of
Rhus and Vitis sp.

Sept. 2 - 11 mi. w.s.w. of
Cedar Springs, 4 mi. s.e. of
Merlin, ~~near~~ Lake Erie.

39626 *Vitis riparia* Mx. possibly *off. var. rotundifolia*
climbing
on bushes at edge of cliff

27 *Ludwigia polycarpa* Mx.
very common in dry roadside
swale.

28 *Echinochloa*
very common in drying
roadside swale, with #39629.

29 *Echinochloa*
very common in drying
roadside swale, with #39629

Sept. 2 Rondeau Provincial Park
Lake Erie.

Flat sandy peninsula
densely wooded in interior
with mostly beech-maple,
some elm and oak. prominent
shrub layer, sparse ground layer.

At Point Lonsdale the forest
is largely *Fraxinus nigra* (?),
Quercus rubra (?), *Pinus strobus*,
Quercus alba, *Tilia* sp. *Sassafras* etc.

Soil is a mixture of sand and
gravel. Rather thick undergrowth
of *Fraxinus* and *Sassafras*.

extensive woody vine,
fruits blue-black, not
sweet and with a disgusting
flavor.

culms almost erect.

culms almost erect.

saplings. Thick ground
layer of many herbs and
very small shrubs and
seedlings.

A ~~strip~~ strip back of the beach
about 10-15 m. wide has
herbs such as *Panicum* (?),
Polanisia, *Artemisia*, *Andropogon*
scoparius, *Apocynum cannabinum*
(a prostrate form), *Andropogon*
gerardi, etc. *Rhus toxicodendron* (dwarf form).

The *Quercus rubra* here is very
odd. Lvs not V shaped buds large,
hairy.

Euphorbia
spinescens
latifolia
calycata
angustata

In front of the Ulster
 300 ft. 200 ft. 100 ft. 50 ft.
 200 ft. 100 ft. 50 ft. 20 ft.
 100 ft. 50 ft. 20 ft. 10 ft.

occasional, but mostly by the
 100 ft. 50 ft. 20 ft. 10 ft.

A number of small
 flowers with many
 small green and yellow
 range flowers common in
 the woods back of beach.

In the forest on the top of the
 hill for it is on a hill
 about 100 ft. tall, 100 ft. diam.
 above the bottom of the hill
 very wide, about 100 ft. high.
 some ground cover of low-lying
 Collinsonia, Proserpinaca, etc.
 low, swampy, with
 beach maple forest. Near
 a 10 ft. high detritus mound
 100 ft. tall and over 3 ft. thick.
 Most trees in area have
 slight development of buttresses.

End of the path the trees
 gradually become more
 and are the principal crops.
 The plants become larger and
 more frequent, some of them
 natural, some planted.
 Some pasture. Near Clearfield

People come here for relaxation and enjoyment. Camping offers pleasure to many people. Please do not intrude upon, or disturb the enjoyment or rest of your fellow campers.

The Naturalist Programme of conducted walks, illustrated talks, labelled nature trails and a museum will increase your pleasure of the Park.

Rondeau attracts large numbers of people who come to enjoy a picnic, the beaches, or the natural setting. You can help to make your stay, and that of others more pleasant by being tidy. Containers are provided for all refuse. Broken bottles are dangerous when left lying on the ground. A commendable practice is, "leave the site a little tidier than you found it".

Fires are ever a problem and a hazard in a woodland park. Fireplace grilles are provided for your convenience, and also for your protection, as well as others. A fire that has been reduced to "DEAD OUT" can neither harm anyone, nor this beautiful Park.

Bath houses are provided on bathing beaches for those who come to swim. They must be used for dressing and undressing.

All rules and regulations in force, are based on a respect for the rights of yourself and all others.

Park Rangers are here to help you; you can help them by following the rules.

Suggestions or constructive criticisms are always welcome. We too can learn.

Clare E. Mapledoram
 Minister.

F.A. MacDougall,
 Deputy Minister.

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ONTARIO

DEPARTMENT
OF
LANDS AND FORESTS

Division of Parks

WELCOME TO:

R O N D E A U P R O V I N C I A L P A R K

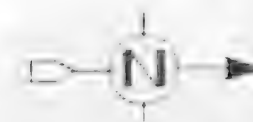
Rondeau Park is a beautiful area in which has been preserved about 2000 acres of the finest hardwood forest types in Southern Ontario.

Many of the trees and plants growing in the Park are rarely found farther inland. Rondeau also embraces about 2000 acres of marshland. The combined area offers a habitat which attracts many species of birds and small mammals. A sizable deer herd thrives in the Park.



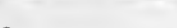
Sand beaches provide water recreational activities par excellence. There is opportunity for the angler to indulge in this favoured sport.

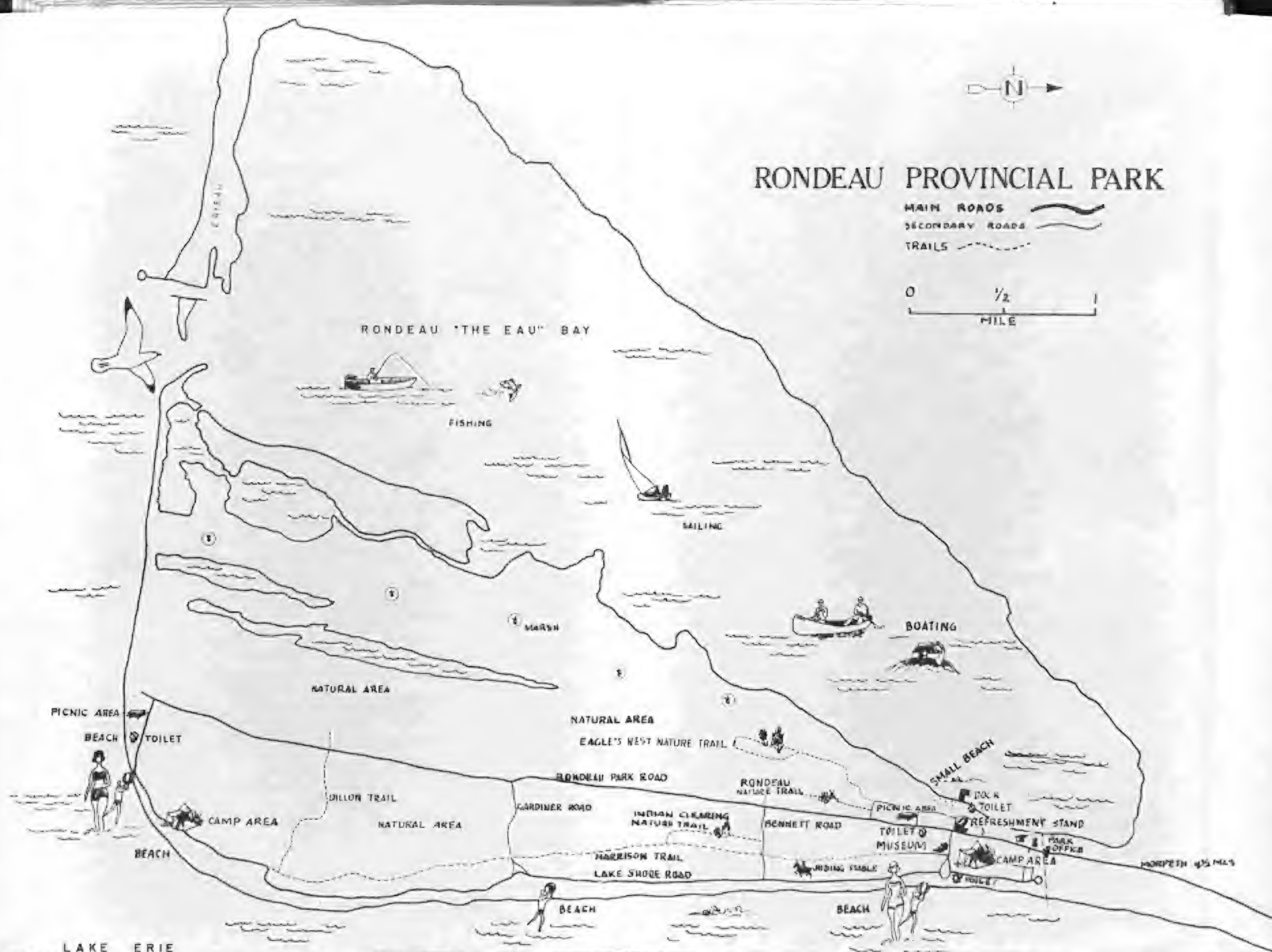
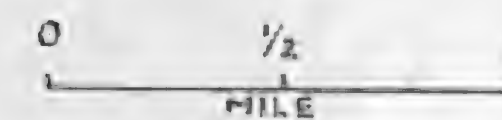
To "YOU", the visitor

This unique Park is maintained for your enjoyment by the Ontario Department of Lands and Forests. The woodlands, the beaches, the camp and picnic areas, the museum and nature trails, the buildings and facilities are maintained for your convenience and recreation. We ask that you care for them as though they were your own.



RONDEAU PROVINCIAL PARK

MAIN ROADS 
SECONDARY ROADS 
TRAILS 



LAKE ERIE



DEPARTMENT
OF
LANDS AND FORESTS
Division of Parks

WELCOME TO:
RONDEAU PROVINCIAL

Rondeau Park is a beautiful area has been preserved about 2000 ac of finest hardwood forest types in S Ontario.

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Ontario

171

series of pastures showing various stages in succession from a very young spruce forest.

Near the edge a large ant bed of flowers is common called "light leaf" with some patches of red and smaller green leaves. This common here but not seen much elsewhere.

Near St. Thomas country is more intensively cultivated with less woods, but with prominent hedgerows. East of St. Thomas considerable grain.

The country near St. Thomas becomes more rolling and not perfectly flat as it is farther west. I should drop out of the picture.

East of the road is a large area of woods. From Tillsonburg to Toronto one of the principal crops is "light leaf" tobacco. There are many woodlots and some pastures. The tobacco is just starting to be harvested. The leaves are now being taken to the packing house.

In from beach to Ulmus.
Ostrya, *Fagus*, *Acer rubrum*,
Acer nigrum var. become common.
Rhus typhina and
R. canadensis common on
 ground with *Maianthemum*
 occasional, here under hardwoods.

A form of *Asclepias*
 tuberosus with very
 small cyms and pale
 orange flowers common in
 clearings back of beach.

In central part of park
 in deep forest is an elm
 about 100' tall, 2 ft. + diam.
 above buttresses. Buttresses
 very wide, about 1 ft. high.
 Dense ground cover of *Lochnera*,
Collinsia, *Onoclea*. Area
 low, swampy, with
 beech maple forest. Nearby
 a *Populus deltoides* well over
 100 ft. tall and over 3 ft. dbh.
 Most trees in area ~~to~~ have
 slight development of buttresses.

East of Morpeth the tobacco
 gradually drops out, maize
 and hay are principal crops.
 Woodlots become larger and
 more frequent, some apparently
 natural, some planted.
 Some pasture. Near Clearfield

Ground here
 is parallel
 ridges,
 alternating
 from storm
 beaches
 every 100 ft.
 or more.

a series of pastures ~~showing~~
 showing various stages
 in succession from grass
 to *Crataegus* thicket.

Near Eagle a different
 sort of tobacco is common,
 called "brightleaf", with
 taller bushier habit, and
 smaller greener leaves.
 This common here but not
 seen much elsewhere.

Near St. Thomas country
 is more intensively cultivated
 with less woods, but
 with prominent hedgerows.
 East of St. Thomas considerable
 grain.

The country near
 St. Thomas becomes more
 rolling and not
 perfectly flat as it
 is farther west. Orchard
 dropped out completely.

Eastward the land is
 rolling, some woods.
 From Tillsonburg to Simcoe
 one of the principal crops is
 "brightleaf" tobacco. There
 are many woodlots and
 groves, some pastures. The
 tobacco is just starting to
 be harvested. The leaves are
 picked off, leaving the stalks
 standing.

Sept. 4 - ~~between~~ just
north of Arkville, Catskill Mts.
39630 *Echinochloa crusgalli* var. *frumentacea* (Pers.) Wright
cultivated as a field crop

Catskill Mts. are well
wooded with hardwoods
with a liberal admixture
of *Pinus strobus* and
Thuja canadensis, some
Thuja plicata but this
might be planted. Near
the tops of some high
peaks and ridges
are slides or steep slopes
more or less bare of
vegetation or only sparsely
vegetated.

Sept. 13 - sleepy hollow, 1 mi.
south of Falls Church, Fairfax Co. Va.

In mixed pine and hardwood
second-growth forest on gentle slope

31 *Ulmus ~~pumila~~ parvifolia* Jacq.
rare

32 *Ulmus procera* Salisb.
rare

Culms erect, panicle
compact, purple and green.

young ^{saplings} ~~trees~~ up to 1.5 - 2 m. tall.

small tree 4 m. tall, with
deeply fissured - very
corky bark.

Oct. 17 - photo of mixed hardwood forest with many fields in part west of Markham.

photo of mixed hardwood on hill s. of Markham. *Quercus prinus* in red cones, green, still green. Another, similar, bet. Markham and Front Royal.

photos of *Liquidambar* forest east side of Skyline Drive at about m.p. 7. same from Rattlesnake Lick Overlook showing *liquidambar*.

From Front Royal to about m.p. 9 *Liquidambar* rather abundant in most places along drive. Large areas of a very uniform low forest on ridges and gentle slopes - reddish brown in color.

Some steeper ridges and west facing slopes have a similar red-brown forest - probably *Q. montana* and *Q. rubra* or *velutina* - photos from Bush Hollow Overlook to north, across Thornton Gap.

Bet. m.p. 35+36 a fine area of uniform oak forest - *Q. rubra* + *velutina*? orange brown. Photos from Pinnacles Picnic ground, also one of *Crataegus* & *Picea* ground entrance.

no photos north at Big Meadows one showing Hawksbill, other

clump of *Betula populifolia*.

Baton Hollow Overlook 2500' - photos n.e. over Baton Hollow - cool hardwood, largely *liquidambar* oak in some areas, a small admixture of pine, especially with oaks.

At first overlook north of Black Rock Gap, looking east, in valley is what appears to be a mixture of pine and *Nyssa*.

Bet. m.p. 92 and 91, on east side, below are good mixed pine and oak forests.

Just north of Ribbap Overlook is an area of *Quercus ilicifolia* mixed with pine and small hardwood. Not very striking. Better developed patch of *Q. ilicifolia* just below overlook. (1910).

At Sawmill Run Overlook is an excellent example of *Quercus ilicifolia* scrub with abundant emergent pines.

From Calf Mt. Overlook can be seen numerous small hills emerging abruptly from floor of the Nandoah Valley. *various* remnants?

Coloring at higher altitudes just past its prime, excellent at middle alt. not quite at best in lower slopes.

Betula populifolia along road 2 mi. s. of Big Meadows

1958 Virginia

Oct. 17 - Rip Rap Overlook, Skyline
Drive, Augusta Co.on roadside, edge of ~~scrub~~~~oaks~~ *Quercus ilicifolia* scrub.

39633

Aster pilosus var. *platyphyllus*
rare

2

2

34

Arnica montana L.
rare

2

35

Cyperus filiculmis Vahl
common

2

36

Salix
rare in edge of scrubOct. 18 - Blue Ridge Parkway at
Mile Post 9, south of Humphreys Rock,
Augusta Co.

weedy road embankment

3

37

Hedysotis purpurea var.
with nos. 39638 and 39639 m

3

38

Hedysotis purpurea var.
with nos. 39637 and 39639 m

3

39

Hedysotis purpurea var.
with nos. 39637 and 39638 mOct. 18 5 mi. n.w. Lexington, 3 mi. e. of
Rockbridge Baths, on a ridge
east of Maury River, Rockbridge Co.
in steep ravine cut in limestone

4

40

Thuja occidentalis L.
common in small area in thin woods

4

41

Oxypholis rigidior (L.) C. & R.
common in shallow soil in thin woods

2910'

890m

(7.9) blades?

Jumps of
branches from a mowed
plant, old stem stiff.
rays white, disk turning reddish.
diffusely branched
main stem erect, branches
ascending.culms spreading & ascending
in small tufts.shrub 1.5 m. tall, leaves
glaucous beneath.representing a very polymorphic
population - in small dense
tufts.

same

same

crooked tree 25 cm. diam.,
with branches almost to base.
fruit smooth, not ribbed
dorsally when fresh.

Oct. 18 - Blue Ridge Parkway →
In first mile cinnamons
understory to be seen locally.
Shenandoah Valley View -

(2355'). Magnificent
hardwood forest here
and on hills below.
very mixed in composition.
coloring now at its bright-
brided end and large yellow,
Quercus prinus greenish trees.
Cornus red, Quercus rubra
red or still green, Robinia
green turning yellow, Fraxinus
purplish yellow, etc. This
extends in very good
development at least to
Humpback Rocks. No
cinnamons understory
at all here.

About m.p. 7 in a valley
to the west is a striking area
of solid pine, probably an
old field. Below this is a
high dam, evidently not
ordinarily filled with water -
probably flood control only.

At m.p. 7 photos in hardwood
forest. Just south of here a patch
of Rhododendron understory,
but this is generally lacking
in this area. Rocks in this
area are mostly greenstone.
Excellent Polypodium, etc.

20-minute Cliffs Overlook -
steep slopes have mainly
chestnut-oak forest, with
scattering of other oaks,
and pines, in places with
understory of Quercus
ilicifolia. Pinus pungens
on rocks around overlook.
In valley below cave forest
with Liriodendron, Pinus
strobus, Fraxinus, etc.
Cultivated and abandoned
fields in valley and on hills
opposite. Colors about perfect.
Rocks covered by Umbilicaria
and other lichens.

~~From here south~~
~~South of here~~ the rock changes
to shale. Cinnamons understory
generally present. Forest
has low stature. Trees
have more nearly lost
their leaves. alt. 3000+

From m.p. 25 to 30 many farms
and pastures, country generally
disturbed. m.p. 30-35, Tsuga
becomes common. some Pinus strobus
and other pines in hardwood
forest. Cinnamons understory
absent or poorly developed. m.p.
35-42 low altitude, alt. 2400'.
Pinus strobus mixed in
hardwood, no cinnamons to
account to anything. South
of here for several miles

good hardwood for
this, make a two or
three with low board
and scrub, some furrows
chiefly, not brass.

Carboniferous up to 1870
to 1870 but the ~~the~~ have steep
walls, largely covered by
pine & lower vegetation of
Vaccinium, etc. prominent

North on 257 from Lexington
to western ridge E. of Maudry
lives with the oak forest
much juniperus, some Pinus
virginiana and a stand of
Thuja occidentalis in a steep
ravine - s. of Rock ridge, Bath.
n. of Lexington

West Virginia - road from
Martinsburg to Chins., over flat
hardwood forest, ^{very} prominent
locally, some *Liriodendron*,
much oak & hick. 9 plants
of slaty fsh, & c., ~~some~~ half
with mica set at 100, others (mostly
in gully less light)

Lygon Valley - forest of *Quercus nigra* (also mixed forest)

The forest throughout this part of West Virginia is well colored, though many

Graves have gullies, bones
very prominent, especially
the saired benches.

Photo. - hardwood forest in
the sort of situation & among the undergrowth
common.

Crumbling shale cliffs -
Mouth of Seneca - *Juncus*
robertianus, *Ranunculus*
marginatus, *Asplenium trichomanes*,
Adiantum.

Laurea Rocks - spectacular
backbone of broad tilted
rocks, continuation of
ridges seen farther north.
Still farther north along
North Fork two walls of the
same rock can be seen
parallel in the hills (photos).

Photo of pines on a hillside
of oak-bushy forest, pines
in front (North Fork)

Northward, where road
cuts through the hard
slates is a talus where
Pellaea, Woodwardia, Draba,
etc. grow both in talus
and crevices of hard
fossiliferous limestone
or heavy sandstone. Is this
Seneca formation?

14-00000
T. Smith
Cavens

Smoke-hole road - from north goes over high mountains covered with deciduous forest in full color. *Acer nigrum*, *Fraxinus* spp. etc. Ravines are dry or almost so. Whole aspect one of dryness.

Smoke-hole recreation area has flat bottom land with grass, hemlocks, pine, *Platanus*, etc. Steep walls with mixed hardwood forest with scattered pines on east wall, one hemlock. On west wall almost no conifers.

Fairly large stream.

Rich ground flora on hemlock grove on east wall - *vacuum*, *Polytrichum*, *Dryopteris*, *Adiantum*, *Asplenium*, *Selaginella*, *Carex*, etc.

but no *Maranthium* seen.

Small patch - *Asplenium*, *megaphyllum* on rock.

~~10/19/53~~Oct. 19 - Mouth of Seneca,
Seneca Creek

on crumbling shale cliff

39642 *Oryopteris marginalis*
common1 43 *Hedyotis purpurea* var. *tenaxifolia*
rare2 44 *Asplenium trichomanes*
commonOct. 19 - North Fork River, 1.4 mi.
s. of Smoke Hole Cavern,in crevices and talus
at foot of limestone cliff2 45 *Muhlenbergia*
common1 46 *Woodsia obtusa*
rare1 47 *Draba*
common1 48 *Pellaea*
rare~~10/19/53~~Oct. 19 - Smoke Hole Recreation Area
Pendleton Co.1 49 *Asplenium rhizophyllum* L.
small colony on rocks
in hemlock grove on steep
west slope

glaucous

glaucous, succulent, rooting
at tips

71650

Oct 11 - Washington, 18th + New Hampshire
 in weedy place along sidewalk
Panicum dichotomiflorum Michx.

culms spreading, depressed.

192

193

192

194

